

COMPUTERWORLD

\$2/COPY; \$44/YEAR

MAY 26, 1986

VOL. XX, NO. 21

TOP OF THE NEWS

Mirroring IBM's relationship with Rolm, Wang Laboratories moves to acquire PBX manufacturer Intecom. **Page 146.**

Sperry customers may be placing purchase orders on hold in light of the continuing merger stalemate with Burroughs. **Page 2.**

IBM's RT PC has yet to find its way into corporate use, but software developers believe it may become a mainstream product. **Page 6.**

Hardware vendors release software standards for implementations of the Pick operating system. **Page 15.**

NCR Comten unveils a communications processor with three times the processing power of IBM's 3725. **Page 37.**

Javelin Software is the latest vendor to offer a corporate licensing program. **Page 27.**

Rear Adm. Grace Hopper, co-developer of Cobol and the woman responsible for standardizing computer languages and procedures throughout the U.S. military, is being forcibly retired by the Navy at the end of August. Hopper, 79, one of the computer world's most valuable players since before World War II, officially retired from the Navy Reserve in 1967. However, by Act of Congress, she has been recalled to active duty on a year-to-year basis ever since. Now, says Hopper's aide Lt. Brenda Sullivan, "The recall is not being renewed. The retirement was not by [Hopper's] choice." Hopper indicates that she already has lined up an unspecified postretirement job.

Citicorp officially tenders its expected \$675 million offer for Quotron Systems, Inc., the Los Angeles-based provider of on-line stock quote information. It was unclear at press time on Friday whether Quotron officers would continue to oppose the bid. Citicorp is offering \$19

See **NEWS** page 6

DEC E-mail an OSI first

Implements X.400 model for networking products

By Elisabeth Horwitt

LITTLETON, Mass. — Digital Equipment Corp. last week became the first computer company to offer users a complete set of commercial networking products conforming to all seven layers of the Open Systems Interconnect standard.

The breakthrough came with DEC's announcement of an electronic mail package that enables users to generate messages on a DEC proprietary editing or E-mail system and then transmit the message to a remote VAX or Microvax system.

The DEC package, called the Message Router X.400 Gateway Version 1.0, is the

See **DEC** page 6

IBM unveils low-end SNA connectivity

By Elisabeth Horwitt

RYE BROOK, N.Y. — IBM last week greatly extended connectivity within its product line by introducing a low-end communications processor and a centralized network management system that oversees a broad range of IBM networking devices.

The developments will provide cost-effective implementation of Systems Network Architecture functionality at small remote sites and on IBM's Token-Ring network.

According to a principal developer of the products, last week's announcement reinforces IBM's commitment to become a complete communications supplier. With the new products, said Chris Harlaut of

See **SNA** page 8

User apathy faces Unix V.3

By Eddy Goldberg

Two weeks before AT&T is to unveil its long-awaited Unix System V update, evidence indicates that corporate computer managers see no compelling reason to switch to Unix.

The new Unix version, called Release 3, is due from AT&T Information Systems early next month, company sources say. It is intended to address businesses' growing need to share files transparently across a multivendor network through AT&T's addition of the Streams networking and Remote File Sharing features.

"We want to provide a network-based

See **USER** page 7

VM networks get MVS communications features

By Charles Babcock

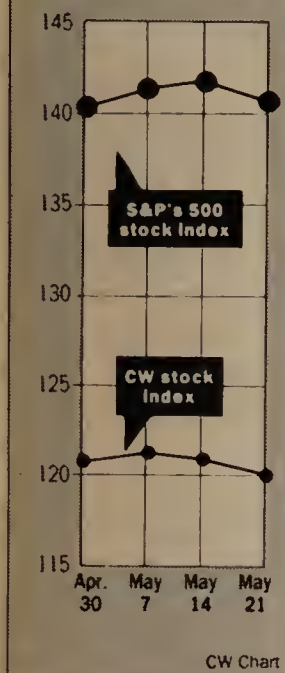
Advanced networking and addressing features of IBM's Systems Network Architecture were made available under the VM operating system last week. The features, which allow users of VM to create larger networks, were previously available only with IBM's transaction-oriented MVS operating system.

"IBM has finally gotten VM up to snuff with other communications products," said one DP executive who had begun to reach the former network address limits of VM.

Specifically, last week's releases affect use of extended network addressing and SNA Network Interchange on SNA net-

See **VM** page 4

Stock update



Stock charts in full, page 145

Executive Report

In-house publishing: Tapping print systems' potential/49

In Depth

Grooming the ideal project manager/69

CW EXCLUSIVE

Shape up: Industrial designers have profound MIS impact

By Clinton Wilder

They talk about behavioral sciences, urethane foam models and "the postmodern aesthetic genre." They never make sales visits or service calls, yet they are intimately associated with the daily lives of every computer user.

They are industrial designers, members of a computer industry subculture that determines product details from the lettering of error messages to the shapes of circuit boards.

Industrial designers' impact goes far beyond pure aesthetics. Design subtleties such as keyboard shape and monitor mobility can affect a very critical part of every information systems manager's

professional life: worker productivity.

"Product design is not an ephemeral thing. It determines how users do their work," says Paul Benigni, manager of Digital Equipment Corp.'s design group, which includes industrial design, graphic design and human factors engineering.

Benigni is one of the more innovative pioneers in the field, having started at DEC 10 years ago when, he says, "computers were nothing but big boxes with very few people using them. Now it's not good enough to put in a shiny metal box and have people be in awe of it. Physically, we began to soften

the forms."

Approaches to product design vary widely across the industry, and many vendors contract with independent design firms or consultants to handle the job. But companies with in-house design teams say they firmly believe that interaction during product planning among designers, electrical and mechanical engineers and marketing representatives is critical to a product's success in the marketplace.

"Determining the right design may be qualitative, but it's not something that can be judged by just one

See **COMPUTER** page 14



DEC's Benigni

NEWS

Sperry rejects Burroughs bid; takeover attempt turns hostile

Group of Sperry users plea for consideration

By Alan Alper

NEW YORK — Burroughs Corp., spurned in its sweetened \$75-a-share proposal to acquire Sperry Corp., last week reverted to a hostile \$70-a-share tender offer to take over its mainframe rival.

The events last week may lead to a protracted struggle for control of the company. The dispute is already causing Sperry customers to postpone orders, according to observers.

Meanwhile, a group of 17 Sperry users in the New England area last week sent a letter to Burroughs Chairman W. Michael Blumenthal and Sperry Chairman Gerald G. Probst requesting that the value of their investment in Sperry equipment be protected during the merger discussions.

May hurt both firms

"We think the merger is going to hurt both companies," noted group chair Elaine Massa, manager of technical services at Connecticut Natural Gas. "We think it's done a lot of damage already."

Of the 40 people in attendance at the group's meeting last week, none felt

the merger would benefit Sperry users, Massa said. "We hope Sperry can get out of this," she said. "The firm has so much going for it right now."

By not responding to Burroughs' \$75-a-share offer by 5 p.m. last Wednesday, Sperry set into motion a series of events that would enable Sperry shareholders to sell their shares to the Detroit company at \$70 a share or wait until Sperry's conditional self-tender offer kicks in at \$80 a share.

Sperry's self-tender, however, becomes effective only if Burroughs is successful in purchasing 33 million of Sperry's shares, a move that would give it a 51% stake in the company. Burroughs would then seek to acquire the remaining outstanding Sperry shares by exchanging them for preferred stock and debt securities valued at \$70 a share.

Burroughs' offer expires on June 5 but can be withdrawn at any time until this Thursday.

"Sperry is trying to utilize every mechanism to avert making the deal, consistent with the board of directors' concern to maximize shareholder value," noted Michael Geran of E. F. Hutton & Co. "They're still working through the options available to remain independent."

The drawn-out takeover fight — while benefiting Sperry shareholders — the majority of whom are institutional investors and arbitrageurs — is causing Sperry customers to postpone orders, Geran said. "If you're an 1100/90 user, would you want to give Sperry \$5 million for another

system right now?" he asked. "The only ones having fun are the arbitrageurs."

Massa agreed that the merger discussions have caused some Sperry customers to postpone orders. "We have an 1100/90 on order. There is some question whether it would be a smart move, given what's going on, to go ahead with it," she said.

The group, which according to Massa recently petitioned the Sperry users group USE to be recognized as the New England Chapter, requested the following if a Burroughs-Sperry merger becomes a reality:

- Continuation of the research and development effort in conjunction with Sperry's product line.
- Continuation of current levels of system and software support.
- Continued assurance of upward compatibility of users' hardware.
- Assurance that major applica-

tions software systems and facilities such as Mapper and Unis are maintained.

- Assurance that responsible, high-quality full engineering support in the Sperry and former Univac tradition is continued.

In a prepared statement, Sperry said it terminated negotiations with Burroughs because agreement could not be reached on a transaction of \$80 a

share. According to Sperry, it entered into negotiations on the understanding the Detroit firm was willing to negotiate a price "north of \$75" a share.

'Evidence of bad faith'

"Sperry believes Burroughs' new proposal of \$75 for the cash portion and securities of uncertain value for the second step violates the explicit understanding upon which Sperry commenced negotiations and is evidence of bad faith," Sperry said. "Sperry remains committed to pursuing appropriate options to enhance shareholder value," the company said in a statement.

Burroughs responded by saying it was "mystified" by Sperry's rejection of its \$75-a-share offer since that "is higher than the value the Sperry board placed on Sperry" in its self-tender offer for \$29.5 million shares. Burroughs declined further comment.

Meanwhile, a shareholder filed suit against Sperry in Delaware Chancery Court, charging that the firm's directors have breached their fiduciary duties and obstructed merger talks with Burroughs. The suit seeks to be recognized as a class action.

CORRECTIONS

The photographs accompanying the question-and-answer story with IBM's William Lowe [CW, May 19] were taken by Maxine Usdan.

In this issue

NEWS

AT&T proposes \$450 million in price cuts in addition to \$1.5 billion in rate reductions announced last month/ **4**

Shortage of software holds back IBM RT Personal Computer/ **6**

IBM packages and enhances five network management offerings into one global management system/ **8**

Southern Bell announces sign up of first two ISDN customers in Atlanta: Prime Computer and Trust Company Bank of Georgia/ **10**

Datamedia Corp. to introduce three Motorola 68020-based supermicrocomputers/ **10**

Economists forecast greater corporate spending later this year as well as in 1987/ **12**

Vendors aim to create standard bus for 80386-based systems, but major players stand on the sidelines/ **13**

Spectrum Manufacturers Association releases first set of software standards for hardware makers implementing Pick operating system/ **15**

SOFTWARE & SERVICES

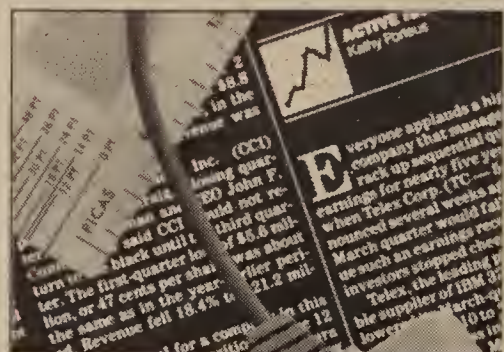
Software International offers Masterpiece accounting software for VAX/ **19**

Orion Group releases the Orion DIA Facility, allowing third-party vendors to develop applications that can use IBM's DIA directly via LU6.2/ **19**

MICROCOMPUTERS

Javelin Software offers "selective" corporate site licensing program/ **27**

Intel announces 82786 very large-scale integration graphics coprocessor to compete with 34010 graphics processor from Texas Instruments/ **27**



See Page 49

COMMUNICATIONS

Nynex and Northern Telecom collaborate to provide Intellihub, an integrated voice and data communications service, to several Manhattan locations of L. F. Rothschild for 12-month trial/ **37**

NCR Comten introduces Comten 5660, a communications processor line said to offer far more speed and line connectivity than any other SNA-compatible communications processor/ **37**

SYSTEMS & PERIPHERALS

Ridge Computers announces work group network server for scientific, engineering applications/ **45**

Multiuser, Unix-based desktop system from Plexus is aimed at small departments/ **45**

COMPUTER INDUSTRY

Wang Laboratories, plans to make Intecom a wholly owned subsidiary in a transaction valued at \$156 million/ **146**

A \$300 million disagreement with creditors prevents Storage Technology from emerging from Chapter 11/ **146**

EXECUTIVE REPORT

In-house publishing: MIS managers can improve their lot and their companies' operations by coordinating electronic document production. By Mickey Williamson/ **49**

IN DEPTH



See Page 69

Cultivating project managers: Hundreds of MIS executives across the U.S. point to the same few traits that distinguish the ideal project manager. By fostering these qualities in their staffs, MIS organizations can guarantee a steady supply of problem solvers with strong peer influence and managerial identity. By Diana Bander/ **69**

More bang for the buck: Leading firms are finding new, more creative ways to use internal information resources to their competitive advantage. By Donald Marchand and Forest Horton Jr. / **79**

OPINION & ANALYSIS

Karten on the human costs of automation/ **17**

Didner on fourth-generation languages' promise of increased productivity/ **19**

Zachmann's personal computer hardware pick for May/ **27**

Horwitt on expanding the standards franchise/ **37**

Raimondi on Memorex's thin-film head technology problems/ **45**

Djurdjevic on optimism in the plug-compatible mainframe market/ **146**

DEPARTMENTS

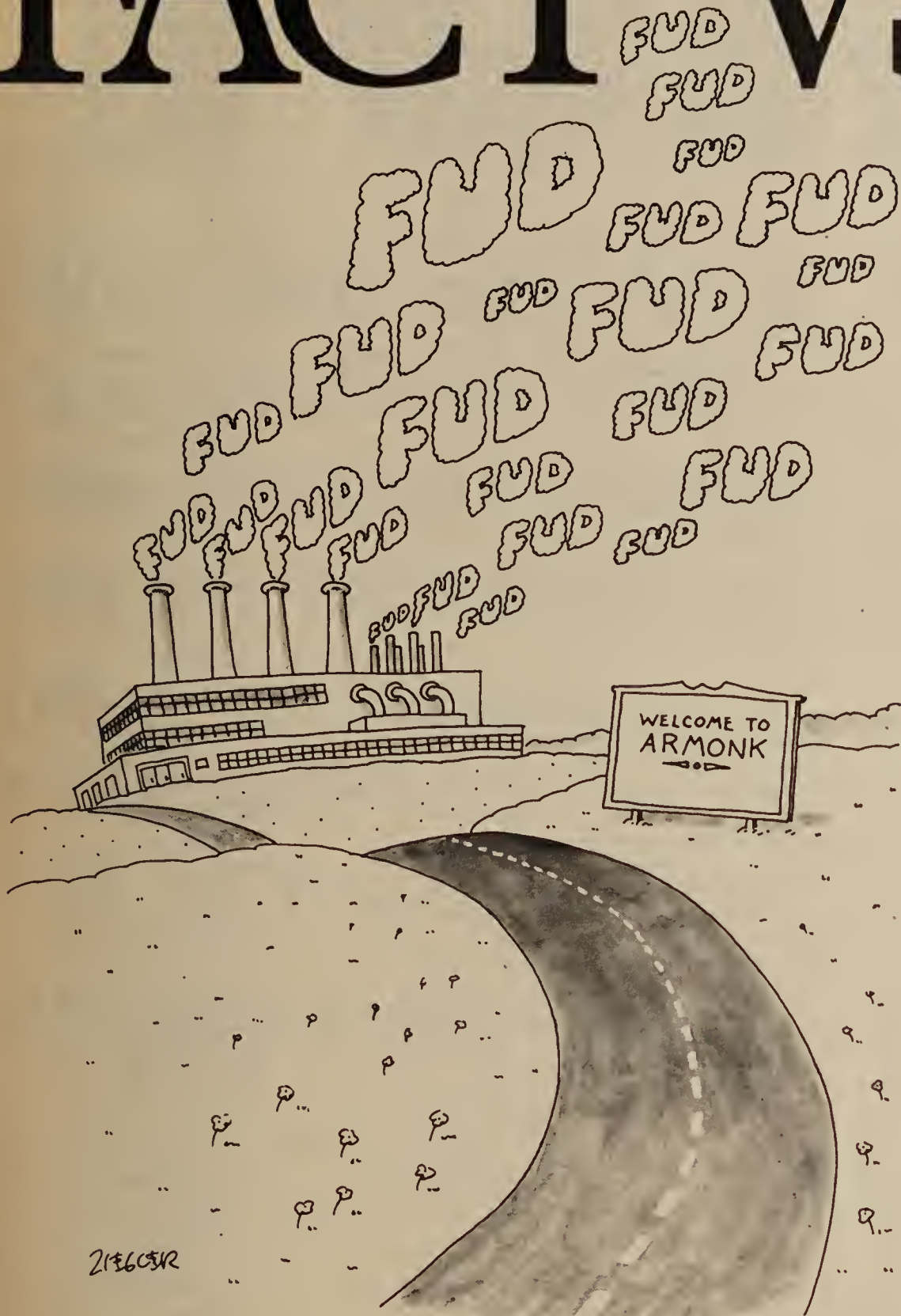
World Digest/ **12**

Editorial/ **16**

New Products/ **85**

Calendar/ **109**

FACT VS. FUD



When a company sells FUD, literally fear, uncertainty and doubt, they're selling what a piece of software could be in the future, rather than what it is today. Because when a company can't sell fact, they have to sell FUD.

And a comparison between ADR/DATACOM/DB®, our relational data base management system (DBMS), and DB2, IBM's latest DBMS, is the perfect illustration of the difference between fact and FUD.

ADR/DATACOM/DB is a complete system. It uses an active, integrated data dictionary to define data, control data and protect data. Automatically. No one knows if DB2 will ever have a data dictionary.

ADR/DATACOM/DB has a complete 4th generation application development system. It helps reduce the applications backlog by increasing productivity. IBM promises one for DB2, eventually. For now, you're stuck with 3rd generation systems.

ADR/DATACOM/DB has migration software. It lets you convert without the ordeal of rewriting all your applications. IBM hasn't even addressed this. So, with DB2, you'll have to rewrite every one of them.

ADR/DATACOM/DB is a DBMS you can network. It lets you distribute data bases across multiple computer sites. With DB2, the site you have is the only site you have.

And ADR/DATACOM/DB is a high performance relational DBMS. It delivers the flexibility end-users need without sacrificing the performance production demands. DB2 can't.

In short, ADR/DATACOM/DB can do all the things your company needs a DBMS to do. Today. Something DB2 can't.

And if DB2 is ever improved to do the things ADR/DATACOM/DB can already do, by then, ADR/DATACOM/DB will be able to do even more. And that's a fact.

For more about ADR/DATACOM/DB, mail us the coupon. Or call 1-800-ADR-WARE.

ADR WE KEEP WRITING THE HISTORY OF SOFTWARE

AN AMERITECH COMPANY

Applied Data Research® Orchard Road & Rt. 206, CN-8, Princeton, NJ 08540 1-800-ADR-WARE. In NJ, 1-201-874-9000.

- ☐ Please send me more information about ADR/DATACOM/DB®
☐ Please have an ADR® Representative call.

Name _____ Position _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Computer Equipment _____

CW5/26/86

For information about ADR Seminars call 1-800-ADR-WARE.

IBM and DB2 are trademarks of the International Business Machines Corp.

© 1986 ADR

NEWS

AT&T cuts rates an additional \$450 million

Slash comes on heels of \$1.5 billion reduction

By Rosemary Hamilton

WASHINGTON, D.C. — So as not to exceed the allowable rate of return dictated by the Federal Communications Commission, AT&T proposed \$450 million in price cuts last week in addition to the \$1.5 billion in reductions it announced late last month.

The price cuts AT&T proposed April 24 were to reflect the lower costs it would incur from the proposed rate reductions in local access charges that go into effect June 1. However, on May 14, the National Exchange Carrier Association (NECA) proposed an even lower access charge. Based on that revision, AT&T would have been earning more than the allowable rate of 12.75%,

even with the \$1.5 billion in reductions it proposed, according to an AT&T spokesman.

Upon receiving the revised proposal from NECA, the FCC requested that AT&T revise its rate reductions to reflect that change or provide justification for not doing so. At press time, the FCC had not yet reviewed last week's proposal from AT&T and therefore could not comment, a spokeswoman said. The price reductions are scheduled to go into effect June 1.

"This is going to put the squeeze on other long-distance vendors," said Michael Killen, president of Strategic, Inc., a market research firm in Santa Clara, Calif. "MCI has already announced it will cut its rates. It's great for businesses and consumers. An average of 10% is a lot of money."

As of last week's proposal, the rate reductions are as follows: AT&T

Long Distance Service is decreased by 13.8% for day and evening hours and 5% for late night and weekend hours. AT&T WATS service will cost 15.2% less. AT&T 800 service will be cut by 12.2%. Its Megacom service rates are lowered by an average of 15.1%. On average, the price cuts are 2.5% greater than the April 24 reductions.

Rates for the AT&T Software Defined Network service were also reduced. Earlier, the vendor said the service would be cut by 10%. According to James Brynes, an AT&T spokesman, the April 24 reduction was actually 6.6% and had been revised to 6.8%.

Brynes also claimed it would not be worth exceeding the allowable rate of return because "it would mean administrative turmoil and costs because we'd have to give rebates to our customers."

VM nets get MVS features

From page 1

works running under VM. Extended network addressing expands the number of logical units that can be included on an SNA network from 64,000 to more than eight million. SNI allows multiple SNA networks to be linked together, according to IBM spokesmen.

The new VM networking capabilities are the result of Advanced Communications Function for VTAM (ACF/VTAM) Version 3 Release 1.1, announced last Tuesday. Prior to Release 1.1, MVS had to be installed as a guest under VM in order for users to take advantage of the MVS networking features.

Sign of commitment to VM

Some large VM users said they liked the new VTAM capability, while others said they will continue to use MVS as their network operating system, running VM as a separate system alongside it. VM traditionally has been used more for program development than for transaction-oriented networks. All agreed, however,

that making ACF/VTAM Release 1.1 available was a sign of IBM's commitment to VM.

"There is a relatively small number of installations with problems solved by ACF/VTAM Release 1.1," said W. Romney White, president of VM/CMS Unlimited, a consulting firm in Dorchester, Mass. But the announcement of the new release is a hopeful sign "that VM appears to be a full partner with MVS," he added.

"It's pretty important to us, because it allows us to grow our network any way we want to," according to a corporate DP manager who requested anonymity. His company was running up against the VM network address limit of 4,000 terminals per domain. "We were going to have to do something by the beginning of next year," he said.

'Treat VM as a major product'

The new release is less useful to a corporate client such as J. C. Penney Co. of New York, which operates a nationwide retailing network, because it already uses extended addressing and SNI under MVS. But William D. Friel, vice-president and director of systems and data processing, said IBM had "no choice but to treat VM as a major product. There is a strong customer base for it."

In addition to extended addressing

and SNI, IBM included a number of enhancements for systems operators.

By using a new Display command, an operator can view the specifications with which a device was added to the network when he is having problems with that device. Previously, he was compelled to go to the Network Control Program generation statement and find the logical unit name, line speed and other characteristics or read through a VTAM dump, according to William E. Warner, IBM's manager of network management products at the Communication Products Division in Raleigh, N.C.

Through a new Force command, an operator can force the shutdown of a device on the network then restart, rather than have a terminal sit locked up while operators search for the problem, Warner said.

IBM also announced Attachment 370+, which permits communications and device support between a host and an IBM Personal Computer AT, 3270 Personal Computer and 3270-PC AT. The program provides access to the information, functions and facilities of the host, including file transfer, execution of host procedures and virtual disk.

Attachment 370+ comes with two interfaces — the Personal Decision Series interface and the Extend/370 interface for experienced users.

800-343-6474

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed? Know any unsung heroes?

If so, we'd like to hear from you. *Computerworld* has established a hot line for information of interest to the computing community. Call us toll free at (800) 343-6474. Ask for the hot line editor.

We can't be everywhere — but our readers are.

COMPUTERWORLD

Publisher
Donald E. Fagan

Editor in Chief
Terry Catchpole

Executive Editor
Sharon Frederick

News Director
Peter Bartolik

Senior Editors

Eric Bender, Microcomputers
James Connolly, Systems
Clinton Wilder, Industry
Elisabeth Horvitt, Communications
Charles Babcock, Software
David Ludlum, Management

Senior Writers

Donna Ramondi
Rosemary Hamilton
Eddy Goldberg
Douglas Barney
Stanley Gibson
David Bright

New Products Editor
Suzanne Weixel

Features Director

George Harrar

Senior Editors

Janet Fiderio

Glenn Rifkin

Associate Editors

Amy Sommerfeld

Becky Batcha

Barbara Wierzbicki

Assistant Editor

Deborah Fickling

Senior Writer

Michael L. Sullivan-Trainor

Managing Editor

Donovan White

Chief Copy Editor

Charlotte Ziems Donaldson

Assistant Chief Copy Editor

Patricia Heal Erickson

Copy Editors

Julie Cook

Penny Janzen

Susan Miller

Kelly Shea

Steven M. Ulfelder

David W. Bromley

Design Editor

Marjorie Magowan

Graphics Editor

Mitchell J. Hayes

Graphic Designer

P. Charles Ladouceur

Graphics Assistant

Jeff Babineau

Assistant to the Editor in Chief

Parth Domke

Editorial Assistants

Patricia Faherty

Christie Sears

Nancy Shannon

Linda Gorgone

Laura Fredrickson

News Bureaus

Mid-Atlantic

201/967-1350

Alan Alper, Correspondent

Washington, D.C.

202/347-6718

Mitch Betts, Correspondent

Southeast

404/394-0758

James A. Martin, Correspondent

West Coast

415/328-8064

Jeffrey Beeler, Chief

Maura McEnaney, Correspondent

Peggy Watt, Correspondent

Computerworld News Service

Susan Blakeney, Director

Edward Warner, Editor

Main Editorial Office

Box 9171, 375 Cochituate Road,

Framingham, MA 01701-9171 617/879-0700

Computerworld is a member of the CW Communications Inc. group, the world's largest publisher of computer-related information. The group publishes over 50 computer publications in more than 20 major countries. Nine million people read one or more of the group's publications each month. Members of the CWCI group contribute to the *Computerworld* News Service, a daily on-line service offering the latest on domestic and international computer news. Members of the group include: ARGENTINA'S *Computerworld/Argentina*; ASIA'S *Asian Computerworld*; AUSTRALIA'S *Computerworld Australia*; AUSTRALIAN *PC World* and *Macworld*; BRAZIL'S *DataNews*, and *PC Mundo*; CHINA'S *China Computerworld* and *China Computerworld Monthly*; DENMARK'S *Computerworld/Danmark*, *PC World* and *Run* (Commodore); FINLAND'S *Mikro*; FRANCE'S *Le Monde Informatique*, *Golden (Apple)*, *OPC (IBM)*, *Theoreme* and *Distributive*; GERMANY'S *Computerwoche*, *Infowelt*, *PC Welt*, *Computer Business*, and *Run*; ITALY'S *Computerworld Italia* and *PC Magazine*; JAPAN'S *Computerworld Japan*; MEXICO'S *Computerworld/Mexico*; THE NETHERLANDS' *Computerworld Netherlands* and *PC World*; NORWAY'S *Computerworld Norge* and *PC Mikrodata*; SPAIN'S *Computerworld Espana*, *PC World* and *Commodore World*; SWEDEN'S *ComputerSweden*, *Mikrodata*, and *Svenska PC World*; SWITZERLAND'S *Computerworld Schweiz*; THE UNITED KINGDOM'S *Computer News*, *PC Business World*, and *Computer Business*; VENEZUELA'S *Computerworld Venezuela*; the U.S. *Amiga World*, *Computerworld*, *inCider*, *Infoworld*, *MacWorld*, *Micro Marketworld*, *PC World*, *Run*, *73 Magazine*, *80 Micro*, *Focus Publications* and *Network World*.

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), July (5 issues), August (5 issues), September (6 issues), October (5 issues), November (5 issues), and a single combined issue for the last week in December and the first week in January by CW Communications Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.

Copyright 1986 by CW Communications Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. †

Special requests for reprints and permissions only should be addressed to Nancy M. Shannon, CW Communications Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 544-3712 or (215) 768-0388 in Pennsylvania.

Subscriber rates: \$2.00 a copy; U.S. — \$44 a year; Canada, Central & So. America — \$110 a year; Europe — \$165 a year. All other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.



ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

TURBO

**Why are SYBACK
& SyncSort CMS
the fastest things
on no wheels?**

**(More technology
in the tank!)**

Call (201) 930-9700.

Arrange a test drive.



syncsort
INC.

You say you've always had very simple tastes? All you ever wanted was the best?

Well, step into our showroom and kick a few tires! We'll show you two programs that are the Ferrari and Lamborghini of VM programs.

- **SYBACK** – the world's fastest and most maneuverable backup, restore and copying program;
- **Syncsort CMS** – the world's fastest and most maneuverable VM/CMS sort program.

What makes 'em so special? Well . . .

(1) TURBO PERFORMANCE: Have you ever stepped down on the gas in a dangerous driving situation and discovered . . . nothing? Well, that'll never happen to you with these two vehicles.

Both are equipped with our special brand of "software turbocharging." We call it FBT, which stands for Fluid Buffering Technique. Our competitors call it something else.

We discovered FBT one dark and rainy night when we were trying to find a way to speed up the movement of data in sort programs. After crying "Eureka," we applied it to our OS and DOS sort programs. The results were . . . wow!

Now we've carried that bright idea over into VM dump-restore and sort programs. And the results are still wow! Compared to any other backup or sort program clogging the nation's VM thruways today, SYBACK and SyncSort CMS will save you up to:

- **50% in Elapsed Time;**
- **45% in VTime;**
- **55% in TTime;**
- **75% in SIOs.**

So who needs all that speed? You do. If you want to optimize your VM operations, stay out of needless DP traffic jams, and make the boss happy with your throughput.

Here's what happened to one large government agency: Their backup operations used to require a full 24 hours to complete. Then they installed SYBACK. Now their backup takes — are you ready? — one-half hour!

(2) EASY HANDLING: SYBACK and SyncSort CMS are among the most flexible, user-friendly programs ever produced by anybody anywhere. That's one reason programmers love 'em. And where does it say that backup and sort operations have to be hard to be good?

(3) "MISTER SOFTWRENCH" SERVICE: We've got the best pit crew in the business. More than 85% of all customer requests are resolved within 24 hours.

If you'd like to put a little high technology in your VM tank, give us a call. We might even take your used VM dump-restore or sort program as a trade-in!

NEWS

Software lag holds up RT PC use

Developers see broader market, dramatic boosts

By Douglas Barney

The IBM RT Personal Computer, a technical workstation announced in January, so far has few users, due to the current dearth of software and a slow rate of shipment from IBM, users and analysts say.

Developers, however, expect dramatic RT PC performance boosts and an increasing acceptance of the RT for multiuser office applications to spur sales.

Computer dealers report that initial orders have come largely from developers interested in porting or writing software for the RT and from hardware and peripherals manufacturers. Volume shipments to dealers have only recently begun, and many dealers have still not received shipments.

Although software and the RT itself are said to be on the way, with most software packages set to ship this summer, corporations are reluctant to buy.

"We have not even thought about it because of the lack of software and not wanting to be on the leading, or bleeding, edge of technology," says Gregory Enders, information center specialist, Williams International Corp. of Walled Lake, Mich.

Williams' engineering staff of approximately 150 people currently uses Computervision Corp.'s CPG 200X for computer-aided design and manufacturing (CAD/CAM) and a couple of Harris Corp. minicomputers. "Our engineers are just now thinking about PCs, but I haven't heard one pop up and say 'RT PC' to me yet," Enders says.

Despite the machine's slow start, and what developers refer to as minor performance problems, the RT may prove to be a highly popular product. IBM says the market for the eight-user RT is more than three million technical professionals in the U.S., and many software developers concur. The market, however, could go beyond technical professionals, and the machine may well become entrenched in the mainstream business market.

For example, at the time of the RT's introduction, three office packages were announced — Solomon III accounting software from TLB, Inc.; office automation software from Applix, Inc.; and Samna+, an integrated word processing and spreadsheet package from Samna Corp. that is one of the few already shipping, according to Samna

President Said Mohammadioun. In addition, a decision support package from Comshare, Inc. targets both technical and business professionals. Many of these packages will be marketed by IBM.

Developers believe the RT will become a mainstream product. "I think the RT could be quite a fast office machine, although it is not positioned that way by IBM," according to Michael Laing, general manager of the Americas division of Moldflow Pty. Ltd., a supplier of computer-aided engineering software and services for plastics and metal components. He said the machine can do double duty by performing office functions and engineering or design functions simultaneously.

"The fact that it runs Unix, has the IBM label on it and can run DOS if you want

”

'We are pretty well convinced that we are just at the beginning with the RT.'

— Michael Laing
Moldflow Pty. Ltd.

it to makes it a very attractive package," says Anthony M. Goschalk, director of marketing for Applix. "There is clearly some attempt from some part of the IBM organization that says there is more potential for this machine than just an engineering workstation."

Some users are holding off, due to questions about the RT's performance advantages. "They must improve performance and cost performance, as well as provide the ability to do the functions that we are doing today, before we will be interested," says a manager of engineers for a Fortune 100 manufacturing corporation who asked not to be named.

But developers believe that increased performance is already on the way. "We are pretty well convinced that we are just at the beginning with the RT. There are a number of enhancements which will be useful to us coming down the pike," says Moldflow's Laing.

Another shortcoming is the limitation of the machine's multiuser capability. Although IBM bills the RT as an eight-user system, most developers recommend putting fewer users on the machine. "From our perspective, the biggest constraint on the RT running eight users is the fact that there are only 4M bytes of real memory, and on any virtual memory ma-

chine, the more real memory you have, the better it goes," Applix's Goschalk says.

Part of users' reluctance may be due to IBM's marketing. "I think it could be marketed a lot more aggressively," Samna's Mohammadioun says.

According to an IBM spokesperson, 12 third-party developers have completed packages, another 16 are close to completion, and 10 to 15 other vendors have begun work on packages. Another 7 packages are co-labeled and marketed by IBM under its vendor logo program, and three packages are privately labeled by IBM.

CAD/CAM tools unavailable

The major holdup has been in CAD/CAM software, the machine's hottest application. "None of the CAD/CAM software is available until September, so a lot of people haven't purchased the RT yet," says Vicki J. Brown, a senior research analyst in the computer-integrated manufacturing service for International Data Corp. Noting that IBM is only just beginning to ship in production volumes, Brown believes that "1986 may not be a good year for the RT, but certainly in 1987 you will start to see it take off."

"I am projecting that over 1986, 10,000 of these boxes will be shipped, but under the current circumstances that might be an optimistic prediction. About 60% will go to the CAD/CAM segment," Brown adds. The Yankee Group estimates that 18,000 RTs will ship this year.

Some developers are committed to the RT because they believe that IBM will continually enhance the product and thus expand its market. "I think we have bought in to the beginning of a family that is going to have a relatively long life. As our software develops and becomes more compute intensive, I think we can count on the RT staying ahead of our desire to consume CPU cycles," Laing says. Frank King, IBM's group director for advanced engineering system development, stated last February that the RT's performance would be doubled roughly every year.

There is another, perhaps even more compelling reason to port software to the RT. "If you are in the workstation marketplace and IBM is doing a workstation, you don't ignore it," Goschalk says.

Yankee Group's Charles Roussell agrees. "They are in it because IBM is in it. It wouldn't matter if IBM sent out a pair of roller skates with IBM on it, they would write something for it."

TOP OF THE NEWS

NEWS from page 1

per share, the same price Quotron rejected last month as inadequate, but Quotron has been unable to find another corporate suitor since then.

At a London conference on graphics software systems earlier this month, Microsoft Chairman Bill Gates hedged his previous statement that a version of MS-DOS that breaks the 640K-byte random-access memory barrier would be ready by the end of 1987. "I have said that, but I'm on shaky ground," Gates said.

The computer-industry trade-show glut claimed another victim last week as the Interface Group cashed its sparsely attended Comdex/Winter exposition. The 3-year-old show, held in March in Los Angeles, had disappointed show sponsors with poor turnout

of attendees and exhibitors.

An alternative to the IBM System/36 is reportedly due this week from Decision Data Computer Corp., a supplier of peripherals and software. The company claims the Decision36 will be targeted at small and mid-size businesses.

Northern Telecom will announce today major upgrades to its newest line of Meridian PBXs. The new options are said to quadruple the speed of the PBX systems, while doubling their main memory capacity.

Reliable sources say that both Rolm Corp. and AT&T will stage the long-awaited announcements of their low-end digital PBX systems at next week's International Communications Association conference in Atlanta.

DEC E-mail an OSI first

From page 1

first commercial software product to implement the X.400 message-handling protocol, one implementation of the seventh layer of the OSI networking model proposed by the International Standards Organization.

As DEC now becomes the only vendor offering an X.400 product, only Microvax and VAX users may use the Message Router. However, according to DEC spokesman David Korf, the new product will allow users to communicate with future X.400-compatible products from other vendors.

"Other companies already are demonstrating prototypes for X.400 software, especially in Europe," Korf said. He added that companies working on the X.12 file formatting standard have expressed support for X.400 as a document transfer and routing standard. At the recent MAP/TOP Users' Group Meeting, members of the Technical Office Protocol subcommittee reported that they were discussing X.400 implementation in TOP.

"All of the major computer vendors will have X.400 products within the next three to six months," said David Terrie, president of Boston-based Newport Consulting. Terrie gave DEC "technical straight As" for being first with an X.400 product. "It's a good strategic move. DEC can be an effective catalyst for industry adoption of the OSI model, providing a backbone that

anyone supporting OSI can talk to."

Terrie called OSI "DEC's weapon against IBM. Everyone is building gateways to SNA," he noted. The emergence of real OSI products will "shift the industry's center of gravity" by allowing multivendor systems to communicate with one another without having to go to IBM's Systems Network Architecture (SNA), he added.

'Rich functionality'

He pointed out, however, that it will be several years before OSI protocols will have the "rich functionality of DEC or IBM's proprietary networking protocols. For example, DEC's directory management is far more advanced." Right now, OSI does provide "basic messaging connectivity," Terrie said.

DEC's announcement is significant because the new X.400 will "play with all the other DEC OSI layers," including the recently announced VAX OSI Transport Service (VOTS) and VAX Packetnet System Interface, according to company spokesman Korf.

VOTS is DEC's implementation of the OSI Transport layer. Packetnet implements the most recent CCITT specifications for X.25 packet-switched networking. Another OSI portion out from DEC last week is VAX OSI Applications Kernel Software Version 1.0, which conforms to the OSI session layer.

Message Router X.400 will be available in quantity in July. Prices start at \$6,240 for the VAX, with the VAX 8800 version costing \$8,000. The Microvax version costs \$2,400.

NEWS

User apathy faces Unix V.3

From page 1

solution to communications-oriented problems, where the end user and application programmer are freed from worrying about whose network underlies the business solution they're dealing with," says Bill O'Shea, executive director of the Software Systems Division of AT&T Information Systems.

Nevertheless, the communications giant still must win over the hearts and minds of corporate users. "I'm still skeptical," says Bob Fredriksen, manager of planning and administration at GATX Corp., a diversified transportation and financial services company based in Chicago. "There's really not much there for us that we're not getting from our PCs," he says.

A recent survey of more than 250 Fortune 1,000 companies, conducted by Forrester Research, Inc. of Cambridge, Mass., showed fewer than one

”

As DOS pushes up against its memory limitations, the networking and file-sharing capabilities of Unix V.3 may be another reason for people to consider Unix as a solution.

in four of the sites surveyed will implement Unix by the end of 1987. Of those sites using Unix today, "Most of the Unix implementations are pilot or are very limited," says Forrester President George F. Colony.

Further, nearly half the sites with Unix currently installed said they have it because "it came with the hardware."

"You'll see it more in manufacturing than in financial applications," says Lydia Borgatta, who heads up advanced workstation development at Bankers Trust Co. in New York. This trend was spotlighted in February when General Motors Corp. called for its suppliers to adopt AT&T's Unix System V or a certified equivalent as the standard operating environment for manufacturing systems [CW, April 28].

"We needed a standard operating system for transportability of application software," says John Williams, senior manufacturing project engineer and chairman of GM's Unix System Implementation Task Force. "We do not want to be tied to a single-vendor solution for hardware or software," he adds.

Williams presents an alternative to the perception that Unix is still best used in laboratories and universities. "We surveyed what was out there, and Unix seemed to have a ground swell," he says, citing its popularity in trade journals, its growth in application software and the IEEE moving toward a standard for Unix (IEEE Trial Use Standard 1003.1 was approved in March). He says he foresees increasing Unix use in office automation and on engineering work-

stations and adds that its transportability will appeal to anyone interested in marketing applications.

Dave Moschella, an analyst at International Data Corp. in Framingham, Mass., says that although Unix has done well on mid-range systems and engineering workstations, it has made little progress at the mainframe or personal computer level. He expects this situation to continue into 1987.

"In commercial environments, Unix has trouble handling large data bases," Moschella says.

'Challenge of the late 1980s'

The Forrester report singled out the integration of personal computers as the "major information processing challenge of the late 1980s." As DOS pushes up against its memory limitations, and as multiuser comput-

ing and shared information processing continue to grow, the networking and file-sharing capabilities of Unix V.3 may be another reason for people to consider Unix as a solution.

"Unix V.3 is going to represent the best way of integrating personal computers," contends Gig Graham, executive vice-president of marketing and sales at Venturcom, Inc. of Cambridge, Mass. Venturcom developed and markets Venix, a System V derivative for processors from Intel Corp. and DEC.

"MS-DOS will always be on PCs, but PCs are getting bigger and faster. MS-DOS 5.0 will probably look more like Unix," Borgatta says.

Another problem area is security. "You don't want the systems programmer for the check processing program to have the same kind of access as the person who wrote the pro-

gram," Borgatta says. The Unix operating system is structured to be entirely accessible to the programmer. Operating systems such as IBM's MVS or DEC's VMS are partitioned to prevent this.

The federal government and AT&T's use of Unix as their operating system for commercial-type applications shows it is possible to add the necessary security to Unix. But this function is not yet well documented nor is it readily available from AT&T.

Unix is still young in terms of the commercial environment, she observes, and though she says she thinks the learning curve will flatten out in a few years, Unix will never replace MVS but will more likely be used for business on coming generations of personal computers and minicomputers.



THE 5th GENERATION

For more than 4 Generations, our FDR DASD Management System has helped more than 5000 users to maximize system productivity. Now we've created a 5th Generation product that significantly enhances FDR's speed, flexibility and ease of use.

FDR Ver. 5.0 is a complete DASD Management System. Data Set backups can be automated (automatically creating a backup when updated). Data Sets which have not been referenced for a period of time can be moved to a cheaper medium. FDR will automatically RECALL the Data Set when it is referenced by a TSO or BATCH user.

- The new performance option reduces the backup time by up to 50%.
- The Data Compression option cuts the size of the backup in half.
- COMPAKTOR can release unused space on a volume without a backup in seconds.
- And much more...

Available for IBM MVS and MVS/XA.

For further information
or Free 90 Day Trial, Call or Write...

INNOVATION
DATA PROCESSING

970 Clifton Ave., Clifton, NJ 07013 • 201-777-1940

NEWS

SNA gets connectivity

From page 1

IBM's LaGaude Laboratories in France, IBM is both extending its current communications product line and enhancing the connectivity of existing offerings "so our customers can install bigger networks more efficiently and cost effectively."

Users also saw the developments as having important implications for IBM's communications strategy. IBM's introduction of the 3720, a low-end member of the 3725 family of communications processors, was "the part of the announcement that I concentrated on," said Trav Waltrip, vice-president of data processing at Travelers Insurance Co., based in Hartford, Conn. "It represents IBM's statement of direction toward less expensive network gateways."

Along with 3720 Models 1, 2, 11 and 12, IBM announced several other communications products, including the following:

- Netview network management package. See related story this page.

- Full-function Systems Network Architecture capabilities for its VM operating systems. See story page one.

- X.25 SNA Interconnection, a software package that allows terminals using SNA to communicate over an X.25 packet-switched network without going through a host.

- IBM 5821 Digital Service Unit/Channel Service Unit Model 10, an interface between IBM systems and AT&T's Digital Data Service lines.

The 3720 benefits IBM customers by "distributing SNA functionality into the ranks of smaller offices," said Paul Kirvan, a principal of Turnersville, N.J., consult-

ing company Paul F. Kirvan & Associates. The 3720 would replace cluster controllers at remote sites, he added, noting, "You can't implement sophisticated SNA network management features on a cluster controller."

"Introducing a low-cost communications controller helps shore up IBM's weak mid-range system line, which Wang Laboratories, Inc., Digital Equipment Corp. and Data General Corp. are competing against, by putting their own mid-range systems in between IBM PCs and mainframes," commented Marty Gruhn, a vice-president at Tempe, Ariz., consulting company Sierra Group.

"I think shrinking the size of the 3720 and having it support the Token-Ring will

”

"I think shrinking the size of the 3720 and having it support the Token-Ring will be very useful to us."

— Trav Waltrip
Travelers Insurance Co.

be very useful to us," Waltrip said. Travelers has 19 IBM 3081 hosts and has already installed more than two million feet of IBM Cabling System wiring for a series of Token-Ring networks that will eventually support some 9,800 terminals, he added. The 3720 will provide a gateway from Token-Rings at remote sites back to hosts at Travelers' headquarters, Waltrip said. "It could have been done with 3725s, but they clearly are expensive boxes that can't be installed at all our remote sites."

The 3720 supports up to four mainframe hosts and is said to offer approximately one-third the throughput performance of a 3275. The 3720 Models 2 and 12 were

designed to operate in a remote environment and can be controlled from a central site via a remote console interface. The 3720 Models 1 and 2, which support up to 28 lines, are scheduled to be available by October this year. The 3720 Models 11 and 12, which support two Token-Rings and up to 16 lines, are scheduled to be available by July 1987. The 3720 series prices start at \$26,000. The new IBM 3721 Expansion Unit, which enables a 3720 to support an additional 32 lines, is priced at \$16,000 with one scanner and is scheduled to ship in October.

Waltrip also expressed interest in the newly announced 3725 Communications Controller Enhancements, which expand the controller's main memory from 2M to 3M bytes and increase the number of 56K or 64K bit/sec. lines per scanner from two to four. "They will allow us to put more telecommunications lines on a 3725, which will help me reduce the total number of 3725s I have," he explained. The 3M-byte storage capability is priced at \$2,700, with availability scheduled for October of this year.

IBM expanded its X.25 support with two software products, X.25 SNA Interconnection (XI) PRPQ 7L1000 and X.25 SNA Network Supervisory Function PRPQ 7L1001 (NSF). The two offerings can either be installed on their own or complement Network Control Program Packet Switching Interface, IBM's current X.25 network offerings, Harlaut said. Available first-quarter 1987, XI enables both SNA and non-SNA terminals to communicate over an X.25 network through a communications controller rather than through a mainframe host. NSF, installed in the controller that handles SNA-to-X.25 networking, collects and records accounting data for traffic handled by XI.

The IBM 5821 Data Service Unit/Channel Service Unit Model 10, also announced last week, transmits at up to 56K bit/sec. over Digital Data Service lines. It also can be used over private, twisted-pair, four-wire networks. Scheduled to ship in July, the 5821 is priced at \$850.

The Data Service Unit and enhanced X.25 support reflect IBM's acknowledgment that "the real world is not all blue" and a determination to sell users total networking solutions, including connections to non-IBM systems, Kirvan said.

Gruhn added: "Our overall sense is that IBM is really reacting to DEC's increasing dominance in the networking arena. To put it bluntly, DEC is breathing down IBM's neck."

IBM's Netview links five network packages

Global manager handles SNA nets

IBM last week packaged and enhanced five network management offerings into one global management system. Netview, IBM's new network management product for Systems Network Architecture (SNA) networks, offers in one integrated package the functions of several existing IBM network management offerings:

- Network Communications Control Facility.
- Network Logical Data Manager.
- Network Problem Determination Application.
- VTAM Node Control Application.
- Network Management Productivity Facility.

Netview "allows our customers to buy one network management product instead of five, and we've also added enhancements to improve the network operator's productivity, thus reducing the cost of his job," said William Warner, IBM manager of network management products.

Through the Netview Status Monitor, the operator can access data on different segments of the network or obtain an overview of all network resources at once.

'Good news'

"IBM's packaging individual network management pieces into a global network manager within VTAM is good news for us," commented Trav Waltrip, vice-president of data processing at Travelers Insurance Co. in Hartford, Conn. "Previously, we had to build an application to link those pieces together to give us overall network management. IBM is saying, 'We have an overall management strategy for both local- and wide-area networking.'"

Paul Kirvan, principal of Turnersville, N.J., consulting company Paul F. Kirvan & Associates, called Netview "the most significant of IBM's new products. In the past IBM has not been renowned for network management," he added. "This seems like a major step in developing a product that manages all the major areas of networking."

"Netview's support of the Token-Ring is especially important," Kirvan explained, "indicating that IBM is bringing all of its major communications products into the system."

He predicted a future IBM announcement of Netview support for System/36 and 38, "because they are key el-

ements of the IBM network picture."

Netview interfaces

IBM is making documentation on Netview architecture available to third-party vendors so that they can write interfaces to the system, Warner said. "We recognize that customers have a lot of network equipment that is not IBM's." Netview's architecture also allows for network diagnostic information to be sent to other network management systems, Warner added. "But IBM wants to provide end-to-end telecommunications network management."

"I suspect that Codex, Infotron, General Datacomm and the other network equipment vendors will soon be announcing compatibility with Netview," Kirvan said.

Netview enhancements include more than 1,500 Help panels and tutorials, a Help desk facility, a status monitor facility, the consistent use of color and function keys in the user interface and a mechanism to enable the operator to move easily from one network management function to another, Warner said.

Netview links

IBM also announced links between Netview and several of its currently available communications devices. Diagnostic and monitoring data collected by the Token-Ring Network Manager, a set of network diagnostic tools announced by IBM last month [CW, April 21], can be sent to Netview for further analysis.

The 3728 Matrix Switch Host Facility, which IBM also announced last week, allows a centralized network management program to configure and monitor functions performed by the 3728 Matrix Switch. The facility will ship in November.

Netview also can access enhanced functions provided on the new IBM 5865, 5866, 5868 modem series, enabling it to retrieve and update remote modem configuration data, trigger through a modem a remote function and gather line analysis and transmit and receive test results from modems.

Netview operates in SNA Advanced Communications Function for VTAM network environments. Monthly licenses are priced at \$1,255 for the MVS/XA version, \$1,060 for MVS/370 and \$940 for VM. MVS versions of Netview are scheduled to be available in fourth-quarter 1986, and VM versions should be available in first-quarter 1987.

— Elisabeth Horwitt

**Denver
Senior High-Tech
Specialists**

**Look for us in the
classified section.**

Blow the route slip circuit!

YES. . . Please enter my own subscription to COMPUTERWORLD — one full year (51 issues) for just \$44*. And I'll receive my Desk Top Solar Calculator FREE with my paid subscription, plus the COMPUTERWORLD FOCUS issues at no extra charge. (Allow 6-8 weeks for shipment of your calculator.)

☐ Bill me. ☐ Payment enclosed. Address shown: ☐ Home ☐ Office

FIRST NAME	M.I.	LAST NAME
* U.S. only.		
TITLE		
COMPANY		
ADDRESS		
CITY		STATE ZIP

1. BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)

20. Finance/Insurance/Real Estate

30. Medicine/Law/Education

40. Wholesale/Retail/Trade

50. Business Service (except DP)

60. Government — State/Federal/Local

65. Public Utility/Communications Systems/Transportation

70. Mining/Construction/Petroleum/Refining/Agriculture

80. Manufacturer of Computers, Computer-Related Systems or Peripherals

85. Computer Service Bureau/Software/Planning/Consulting

90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other

95. Vendor: Other

2. OCCUPATION/FUNCTION (Circle one)

11. President/Owner/Partner/General Manager

12. VP/Assistant VP

13. Treasurer/Controller/Financial Officer

21. Director/Manager/Supervisor DP/MIS Services

22. Director/Manager of Operations/Planning/Admin. Serv.

23. Systems Manager/Systems Analyst

31. Manager/Supervisor Programming

32. Programmer/Methods Analyst

35. OA/WP Director/Manager/Supervisor

38. Data Comm. Network/Systems Mgmt
41. Engineering/Scientific/ R&D/Technical Mgmt

51. Manufacturing Sales Reps/Sales/ Marketing Mgmt.

60. Consulting Management

70. Medical/Legal/Accounting/Mgmt

80. Educator/Journalist/Librarian/Student

90. Other

3. COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as a user, vendor or consultant

A. Mainframes/Superminis

B. Minicomputers/Small Business Computers

C. Microcomputers/Desktops

D. Communications Systems

E. Office Automation Systems

321718621



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
BOX 1016
SOUTHEASTERN, PA 19398-9984



6 REASONS WHY

PDSFAST IS THE CORPORATE STANDARD AT OVER 1,000 MVS INSTALLATIONS WORLDWIDE

- 1 DASD Space Reclamation** PDSFAST can increase DASD space reclamation by 40 to 60 percent.
- 2 DASD Management** PDSFAST interfaces with ALL EXISTING DASD MANAGEMENT PACKAGES reducing elapsed times by 75 to 90 percent.
- 3 IEBCOPY Usage** PDSFAST is a JCL-transparent replacement for lebcopy. It will compress, copy and unload PDS datasets to tape or disk at 5 to 80 times the speed of lebcopy.
- 4 SPFCOPY** Provides ultra high speed compression under SPF 3.1 WITHOUT REQUIRING AUTHORIZATION.
- 5 SMP Processing** Speeds up ALL LEVELS of SMP processing by 25 to 90 percent.
- 6 CICS/IMS** Greatly reduces system downtime by compressing and copying CICS/IMS datasets in less than 1/20th the time presently used.

PDSFAST benchmarks taken from user evaluations:

	<u>Elapsed Time</u>	<u>CPU Time</u>	<u>EXCP's</u>	<u>Job Cost</u>
52 cyl. PDS Compress				
lebcopy	67 min. 18 sec.	12 min. 27 sec.	103,486	\$131.05
PDSFAST	3 min. 23 sec.	8 sec.	712	\$4.22
12 cyl. PDS Copy				
lebcopy	9 min. 14 sec.	1 min. 20 sec.	10,792	\$18.47
PDSFAST	48 sec.	.7 sec.	122	\$1.75
47 cyl. PDS Unload to Tape				
lebcopy	58 min.	14 min. 52 sec.	97,253	\$92.05
PDSFAST	4 min. 3 sec.	37 sec.	911	\$5.74
3380 TSO Volume Compress 2,679 Individual PDS's				
PDSFAST Driver	11 min. 7 sec.	31 sec.	8,299	\$29.87

The PDSFAST driver interfaces with all DASD management and DEFRAG packages.

As you can see, PDSFAST is *ultrafast* and *cost effective*, combining wide ranging performance benefits with transparent operation. Our users tell us PDSFAST is the most impressive performance product they have seen in years.

PDSFAST is saving thousands of dollars daily in human and machine resources at over 1,000 sites worldwide. We are sure PDSFAST will benefit your installation.

For further information about PDSFAST call SEA at (516) 328-7000, located at 2001 Marcus Avenue, Lake Success, N.Y. 11042.

SOFTWARE ENGINEERING OF AMERICA

SEA

NEWS

Southern Bell signs up first ISDN customers

Plans to provide transition service until 1988 rollout

By James A. Martin

ATLANTA — Southern Bell Telephone and Telegraph Co. announced last week that Trust Company Bank of Georgia and Prime Computer, Inc. have signed up to be the first customers of the utility's Integrated Services Digital Network (ISDN), scheduled to be in-

troduced in early 1988.

In the interim, the company said it will begin offering in early 1987 "transitional ISDN access technology," a digital network service that provides dedicated voice and data communications simultaneously over a single telephone line. ISDN will use virtual digital lines, a more cost-effective alternative whereby different customers share lines.

Because of the increased competition resulting from interstate banking, Trust Co. decided "if we were going to

stay on top, we needed to be provide better services," said Tommy Vaughn, vice-president and communications manager of Suntrust Services, a subsidiary formed by the recent merger between Trust Company and Sun Banks of Florida, Inc., in Orlando, Fla.

"Bankers ought not to have to deal with modems when they ought to be making loans," Vaughn said, pointing out that using digital services would not require modems. "ISDN will provide the flexibility we need. With all the networking we do across the spectrum of vendors, ISDN can let us go in and plug in and not have to make a lot of software changes."

Initial costs high

Although initial implementation costs are expected to be high, Vaughn said ISDN will allow the bank to take advantage of such services as video conferencing, which is now too costly.

Trust Company will use 50 basic ISDN lines in branch offices now under construction in suburban Atlanta. Trust Company presently operates five separate networks, including those with specific applications for automatic teller machines and the bond department, and expects ISDN will replace portions of those networks and interface with the remainder.

Prime Computer will be equipped with 25 basic ISDN lines and one primary line in its existing branch office in suburban Sandy Springs, Ga. The basic lines provide two B channels, which carry digital voice or data transmissions at 64K bit/sec., and one D channel, which carries signaling. The primary line will provide 23 B channels and one D channel.

Tying worldwide operations

Prime's Atlanta sales and service office "relies heavily on data communications to enhance our system offerings," said Jim FitzGerald, product manager of ISDN Development for Prime. "Our customers are spread all over the globe, and there is concern and a great need to tie together the worldwide operations with a single topology. ISDN appears to be that topology."

Many of Prime's customers are interested in ISDN technology as well, FitzGerald added. "Banking, brokerage and manufacturing firms will be using ISDN for transaction processing and data base retrievals. Our scientific and engineering customers also want ISDN because it affords high terminal connectivity, security features and high data rates."

Atlanta will be Prime's first venture into ISDN implementation and will provide both local- and wide-area network access to users in the office, according to FitzGerald.

At present, Prime's Atlanta office operates on three Prime superminicomputers tied into the corporate network via Telenet X.25 packet-switching connections.

ISDN will provide the means by which users in the Atlanta office can directly dial up corporate mainframes in Prime's Natick, Mass., office, allowing for more efficient and flexible connections, FitzGerald said.

Tariffs for ISDN services have not been determined, according to Southern Bell officials.

Also last week, Bell South Corp., the holding company for Southern Bell, said it has developed a "dedicated transitional digital facility to ISDN," described as a "three-channel digital multiplexer for a simultaneous digital voice and data communication system."

The system will provide a voice channel for analog telephone and/or analog data services, a medium data channel for any standard 300 to 19,200 bit/sec. asynchronous or synchronous AT&T Digital Data Service and a low-speed data channel for any standard 300, 600 or 1,200 bit/sec. asynchronous data.

Datamedia to announce supermicros

By James Connolly

NASHUA, N.H. — Incorporating the Motorola, Inc. 68020 as a microprocessor, Datamedia Corp. is scheduled to introduce three additions to its DMC/932 family of 32-bit supermicrocomputers today.

The systems, supporting up to 32 users, were designed for use as distributed processors and departmental processors in medium-size or large organizations and as central processors in small companies.

While earlier models in the DMC/932 line used Motorola 68010 chips, the new models are based on a 16.7-MHz 68020 and an optional Motorola 68881 floating-point coprocessor. In addition, the mid-range DMC/932 Model 2620 and high-end DMC/932 Model 2640 include a 16K-byte dual set cache.

According to Datamedia, the Model 2620 running the U.S. Steel Corp. Cobol benchmark provides more than twice the power of the Digital Equipment Corp. Microvax II or the IBM 4341 Model 1 for \$22,500. The entry-level system, the DMC/932 Model 2610, costs \$18,500 and the Model 2640 costs \$28,500.

Datamedia is targeting the systems at IBM host DP environments with IBM Systems Network Architecture Synchronous Data Link Control, 2780/3780 and Bisynchronous 3270 emulation capabilities that reportedly allow remote connection to up to four hosts at speeds of up to 56K bit/sec. The systems allow Ethernet connections, multiuser windows and menus.

"We believe this application of industry standards, advanced microprocessor technology and networking capability will enable MIS/DP departments to take advantage of the cost-effectiveness of the latest technology while protecting their current investments in data processing and communications equipment," said Datamedia President Guy A. Daniello.

The systems, which run AT&T Unix System V Version 2, reportedly are upgradable from the Model 2610 through the Model 2640.

The base configurations include 2M bytes of memory, which can be expanded to 16M bytes. The systems also can be expanded to support 500M bytes of disk storage.

Based in Nashua, Datamedia is a private company that claimed sales of \$26 million in 1985. Their supermicros are distributed through a direct sales force, OEMs and systems houses.

St. Paul
Senior High-Tech
Specialists

Look for us in the
classified section.

"Before HarrisNet tied us together,
we had a lot more time on our hands."

"What hands?"

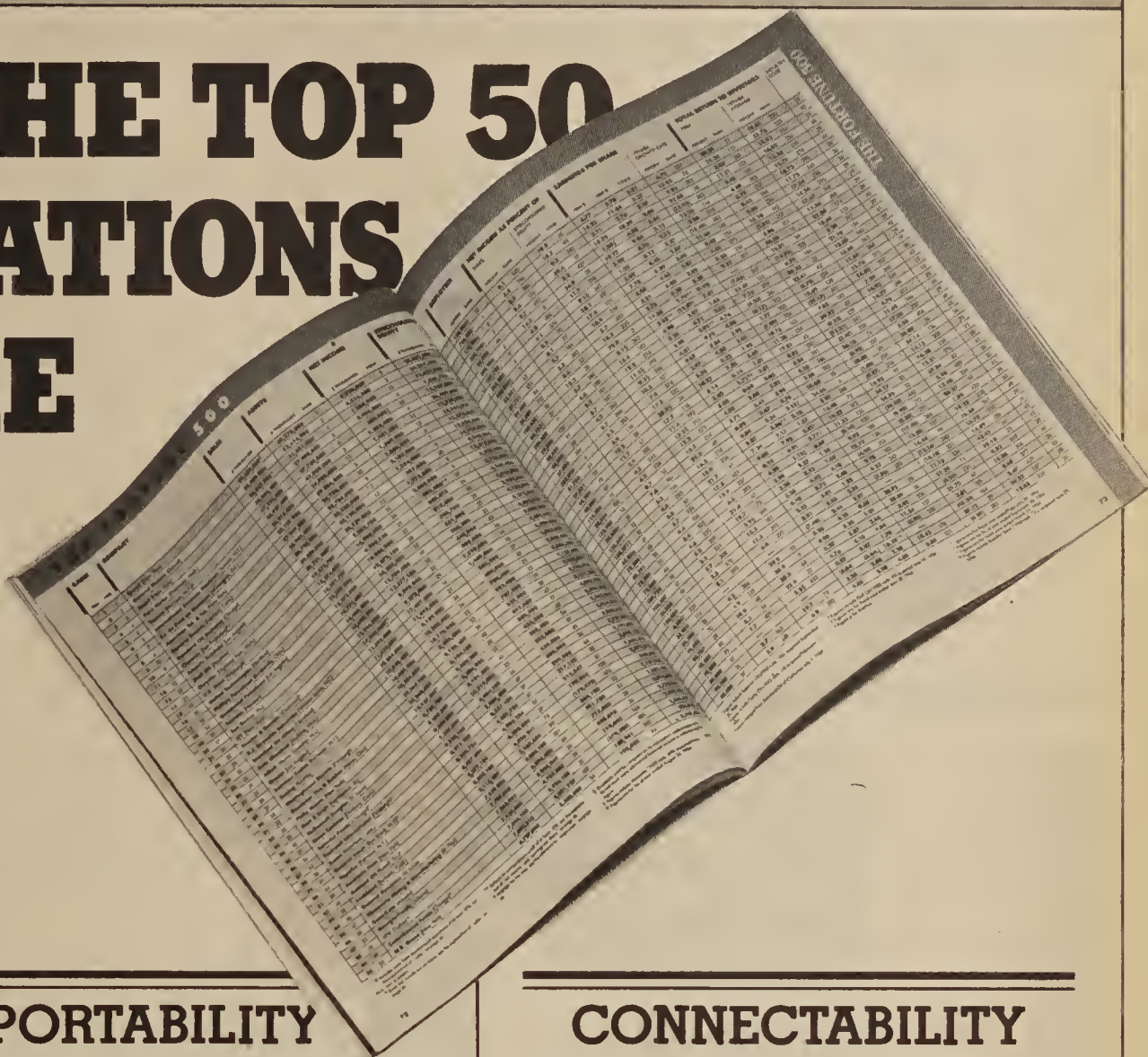
FOR YOUR INFORMATION,
OUR NAME IS
HARRIS

For more details on how HarrisNet can get your
terminals working together, call 1-800-4-Harris, Ext. 21.

 HARRIS

Oracle Corporation invites you to the last DBMS Seminar you'll ever have to attend.

WHY 31 OF THE TOP 50 U.S. CORPORATIONS USE THE SAME RELATIONAL DBMS: ORACLE



COMPATIBILITY

The ORACLE® relational database management system is compatible with IBM's SQL/DS and DB2. SQL/DS and DB2 represent IBM's latest generation of database management technology for IBM's largest computers. ORACLE's capabilities and user interface — the SQL language — are identical to those of SQL/DS and DB2. Programs written for SQL/DS and DB2 will run unmodified on ORACLE.

PORTABILITY

SQL/DS and DB2 run only on IBM mainframes; ORACLE runs on IBM mainframes, DEC, DG, AT&T, HP, Stratus, Sperry, Prime, Honeywell and several other manufacturers' minicomputers, and on a wide range of microcomputers including the IBM PC/XT and PC/AT. ORACLE runs under vendor-proprietary operating systems or under UNIX™. All versions of ORACLE are identical and include a complete implementation of SQL — not a subset.

CONNECTABILITY

Having the same software running on your mainframe, minis, and micros greatly simplifies the task of connecting your machines into a network. ORACLE's network software allows microcomputer users to directly access data stored in the shared database on the mainframe or minicomputer, or copy that data into the database on their micros and operate independently.

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today, the largest companies around the world use ORACLE. In fact, INC MAGAZINE ranks Oracle as the fastest-growing major software company in the USA. Surprised? Don't be. ORACLE is the number one relational DBMS, with thousands of installations on IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC.

To attend the next free, half-day seminar in your area or receive additional information, write Oracle Corp., Dept. CW10, 20 Davis Drive, Belmont, CA 94002, or call 1-800-345-DBMS. From now on, it's the only DBMS phone number you'll ever need.

ORACLE Seminar Schedule

AK Anchorage Jun 24	KY Louisville Aug 7	NY Syracuse Aug 19	TX Houston Jun 10, Aug 19
AZ Phoenix Jun 5, Aug 5	LA New Orleans Jul 11	OH Akron Jul 23	San Antonio Jul 8, Aug 27
CA Los Angeles Jun 10	MA Boston Jun 19, Jul 16	Cincinnati Aug 5	UT Salt Lake City Jun 5, Aug 6
..... Jul 10, Aug 6	Burlington Aug 12	Cleveland Jul 22	VA Norfolk Jun 4
Newport Beach Jul 15	MD Bethesda Jun 12	Columbus Aug 12	Richmond Jun 19
San Diego Jun 17, Aug 7	 Jul 9, 23, Aug 7	Dayton Jul 8	VT Burlington Aug 6
San Francisco Jun 19, Aug 5	ME Bangor Jul 3	OK Oklahoma City Jun 24	WA Seattle Jun 12, Jul 15
Sunnyvale .. Jun 10, Jul 8, Aug 7	MI Detroit Jun 10, Jul 15, Aug 19	Tulsa Aug 26	WI Milwaukee Jul 17
CO Denver Jun 17, Jul 17	Grand Rapids Jun 13	OR Portland Jul 24	
CT Hartford Jul 16	MN Minneapolis Jun 26, Jul 22	PA Harrisburg Jul 8	
New Haven Aug 20	MO St. Louis Jun 11, Jul 30	King of Prussia Jul 24	
FL Jacksonville Aug 5	NE Omaha Jul 9	Philadelphia Jun 18	
Tampa Aug 6	NJ Cvt. Station Jun 5, Aug 7, 28	Pittsburgh Jun 19, Aug 7	
GA Atlanta Jul 15	Iselin Jul 8, 22	Scranton Aug 5	
IA Des Moines Jun 25, Aug 27	NY Albany Jul 23	RI Providence Jul 8	
ID Boise Jul 31	New York City Jun 12, 25	TX Austin Jul 10, Aug 19	
IL Chicago ... Jun 12, Jul 8, Aug 14	 Jul 24, Aug 12, 26	Dallas Jun 11, Jul 22	
IN Indianapolis Jun 17, Aug 19	Rochester . Jun 19, Jul 10, Aug 13	Fl.Worth Jul 15	

Canadian Seminars

Calgary Jun 3
Halifax Aug 20
Ottawa Jun 12, Jul 12, Aug 14
Chicoutimi Jun 18
Toronto Jun 3, Jul 8, Aug 5
Vancouver Jul 10
Winnipeg Jun 3, Aug 5

ORACLE®

Relational in the product, as well as on the label

Call (800)345-DBMS today.

Ottawa (613)238-2381 ☐ Quebec (514)337-0755 ☐ Toronto (416)362-3275
ORACLE-U.K. (SURREY) 44-1-948-6976 ☐ ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

© 1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM. DEC, DG, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks. TRBA.

See us at NCC

NEWS

Business economists foresee more 1986 corporate spending

Rise in computer sales concurrent

By Mitch Betts

WASHINGTON, D.C. — Many U.S. business economists are becoming optimistic that corporate profits and investments will increase later this year and in 1987, a broad trend that might translate into more corporate spending for computer systems and a modest recovery for the computer industry.

The bullish economic as-

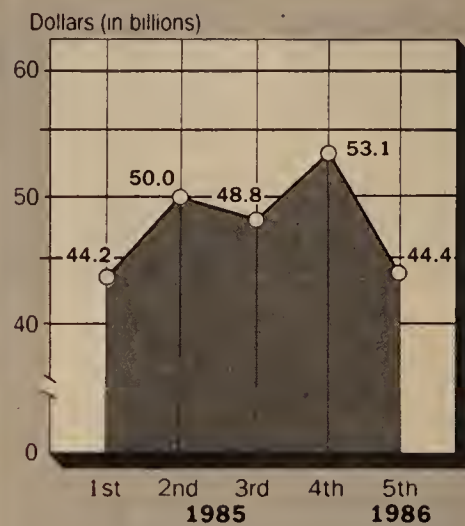
essment came from a survey of 330 members of the Cleveland-based National Association of Business Economists (NABE). The quarterly survey, released last week, predicted 5.5% growth in business investment, equipment and building this year and 5% growth in 1987.

The association's optimism for 1986 is not universally shared. McGraw-Hill, Inc.'s spring survey of capital spending plans indicated that spending by nonpetroleum industries will increase only 1.2% this year.

The first quarter of 1986 was clearly a bad one for computer sales in the U.S. Seasonally adjusted figures released last week by the U.S. Department of Commerce showed that domestic sales of office computing equipment dropped by \$8.7 billion (in constant 1982 dollars), or more than 16%, from the fourth quarter of 1985 to the first quarter of 1986.

However, several important economic indicators are suggesting a stronger economy in the second half of this year, according to a report by industry analysts at Alex Brown & Sons, based in Baltimore. "We believe an improved economic climate is critical to stronger order rates" for information systems, the analysts reported.

Office computers: Quarterly sales in the U.S.



Figures are based on 1982 dollars, seasonally adjusted.

Information provided by the U.S. Department of Commerce, Bureau of Economic Analysis

The NABE's increasing optimism about the U.S. economy was fueled by declining oil prices, a factor that reduces inflation and business costs, thus improving profit margins, according to Kathleen M. Cooper, NABE president and chief economist at Security Pacific National Bank in Los Angeles.

"We think capital spending will come back. The main reason that businesses aren't spending more than they are is uncertainty" over federal tax reform and the economy's future, she said.

Cooper said the predicted moderate growth in business spending and the declining value of the dollar will help the computer industry recover from its slump.

Atlanta Senior High-Tech Specialists

Look for us in the classified section.



WORLD DIGEST
Computerworld
News Service

BRUSSELS — The European Community's (EC) Esprit technology research project will triple in size next year, if a recommendation made by the EC last week is accepted

by the 12 member nations.

The expanded second phase of the program would represent about 30,000 man-years of work, according to one EC official, and the new five-year budget could reach roughly \$4.6 billion.



TOKYO — Mitsubishi Electric Corp. Tuesday released an artificial intelligence workstation called the Melcom Psi that executes high-speed processing in the Prolog language.

Mitsubishi claims it has incorporated what analysts call a 4.5-generation computer — a sequential inference machine — developed by the Institute for New-Generation Computer Technology (ICOT), Japan's think-tank for fifth-generation computer research.

The language for the new workstation is the Extended Self-Contained Prolog (ESP), an AI language from the ICOT project. ESP is expected to enable program modularization.



TOKYO — In the first deal of its kind with a foreign vendor, Japan's Nippon Telegraph and Telephone Corp. (NTT) inked a \$250 million, five-year contract this week to purchase digitized telephone exchanges from Nashville-based Northern Telecom, Inc., beginning in 1989. Northern Telecom won the procurement deal over AT&T in a bidding battle that dates back to the summer of 1985.

For NTT, the pact with Northern Telecom was the largest supply contract with an overseas communications vendor since the leading Japanese common carrier opened its doors to foreign

procurement in 1981.

PARIS — IBM, the French bank Paribas and French computer services company Sema-Matra will probably begin work next month on the value-added network announced last February.

The decision by Paribas and Sema-Matra to launch a value-added service with the U.S. computer giant's French subsidiary drew considerable attention during French elections back in March.

All European telecommunications, with the exception of those in the UK, are controlled by state-run telecommunications authorities, which are often protective of their markets and uneasy about the penetration of foreign firms.

It appears now, however, that the network, which would be one of the first value-added services in Europe, will proceed.



SYDNEY, Australia — The Australian software industry could be dealt a stiff blow if a Copyright Law Review Committee yields to lobbyists' efforts seeking to diminish copyright protection, according to Australia's largest industry organization.

"The protection is absolutely paramount for the continuing development and expansion of the software industry. Software represents vital productivity tools for other industries and our access to these products at or near world prices affects our international competitiveness in these industries," an Australian Information Industry Association spokesman said.

See DIGEST page 15

"We're looking for fresh ideas in office automation."

"Harris."

"Hired."



FOR YOUR INFORMATION,
OUR NAME IS
HARRIS

For more details on how our office automation systems can help your company, call 1-800-4-Harris, Ext. 11.

 **HARRIS**

NEWS

Major players' absence hinders attempt to define 80386 bus

Microsoft, Compaq, IBM stay on sidelines

By Eric Bender

BOSTON — An attempt to define a standard bus for Intel Corp. 80386-based machines, which could accelerate commercial shipments of the next-generation systems, was formally disclosed last week by Phoenix Technologies Ltd. But the absence of public backing from IBM, Microsoft Corp. and Compaq Computer Corp. created considerable skepticism about its chances for success.

Phoenix, which supplies IBM Personal Computer-compatible systems technology that AT&T and many other OEMs have built into their micros, wants to create a standard hardware architecture for Intel's new 32-bit CPU that will allow vendors to create machines within three months.

Standardizing on a bus would nail down only one major hardware aspect of the new machines, leaving many software incompatibility issues unaddressed. But it would let peripheral suppliers begin developing products, thus encouraging system manufacturers to plunge ahead, according to Phoenix Chairman Neil Colvin. "There are many manufacturers today, sitting ready, wanting to introduce the 80386 into the marketplace," Colvin said. "But there's real fear of being odd man out."

Working group

As a first step, the Norwood, Mass., company brought together 44 systems and peripherals manufacturers a month ago at the Comdex/Spring show and established a working group with members from AT&T, Chips and Technologies, Emulex Corp., Olivetti Corp. and Tandy Corp. Scheduled to meet late last week, the working group aims to produce a draft standard for discussion next month during a gathering at the National Computer Conference.

While IBM's involvement "would be nice, I don't think the people attending the meeting at Comdex thought it was crucial," Colvin declared. The general industry consensus is that IBM will not introduce any 80386-based systems for at least nine months, he added, and other suppliers feel that "to sit back and wait . . . is to lose a major advantage."

However, Boston-based Yankee Group analyst Michael Goulde was among the skeptics about prospects for the standard effort. "The 386 will not be a low-end, work-at-home machine — a Tandy machine," Goulde said. "This will be a \$7,000 applications processor for corporate America. . . . These vendors may set a standard, but corporate America votes on the standard, and corporate America votes for IBM."

IBM declined comment on the standardization effort and on any product schedules. A Microsoft spokesman remarked only on the problems facing those attempting to standardize desktop systems without the active cooperation of IBM and Microsoft. "Compaq is not involved in any way, and our view is that committees don't set industry standards, markets do," said Michael Swavely, Compaq marketing vice-president.

Despite Tandy's participation in

the Phoenix effort, Graham Beauchum, vice-president for computer merchandising, downplayed near-term commercial expectations for systems built around the 80386: "We see the 80386 as a 1990-type event."

Late summer delivery

But Colvin, who said he has seen demonstrations of three prototype 80386-based systems, predicted that the first commercial systems will be delivered by late summer, with perhaps half a dozen by year's end.

He suggested, "On Day 1, they will look very much like turbo ATs" — systems running standard packages at greater speed, rather than software specially tailored for the 386.

In the long run, however, "very few of them will be PC clones in the sense that we think of PC clones today," Colvin said. With memory protection features built into the hardware, the 80386 can support multiple operating systems concurrently and independently.

Compaq's Swavely forecast that the 80386 machines initially will divide into two classes: extremely high-performance single-user machines and Unix systems. He would not hint at any Compaq plans, although he reiterated, "We don't feel we have to wait for IBM to do things before us. . . . We didn't wait for IBM to say that an 8-MHz AT was okay."

"I think you will see 80386-based

product announcements as early as tomorrow," Swavely added. "Actual product availability may be something else. We'll start seeing first availability in the fourth quarter and volume availability in the late fourth or early first quarter."

Like many other vendors, Compaq does not expect IBM to lead the parade of computers powered by the Intel chip. "First, they've made a major investment in the next generation of PC-DOS, specifically related to 80286 architecture, so I don't think they're too anxious to move into a next-generation product," Swavely said. "Second, the 386 offers a level of performance comparable to many of IBM's mid-range products."

Announcing

Computerworld's New MICRO DIRECT SHOPPER

An easy way for you to order micro products.

Now you can order microcomputer products directly from suppliers through Computerworld's new MICRO DIRECT SHOPPER.

Beginning with this issue, Computerworld's display classified section will include MICRO DIRECT SHOPPER, an all new section designed especially for companies that sell their micro products by mail or telephone orders.

This can mean a savings of money, time and energy in locating and acquiring the micro products that you need. MICRO DIRECT SHOPPER will appear preceeding the Buy-Sell-Swap section every week in Computerworld.

Starting this issue, see page 125.

COMPUTERWORLD

A PUBLICATION OF
CW COMMUNICATIONS

NEWS

Computer designers

From page 1

person," says Pete Simpson, a development engineer for Wyse Technology, Inc., a San Jose, Calif., terminal manufacturer. "Our design evaluation process represents a cross-section of the company. The product has to be not just what we like, but what we think corporate America wants."

Much of what the computer user wants is obvious and has been well documented: products that are ergonomi-

cally comfortable and easy to use.

But behind those basic concepts is an array of factors that industrial designers must grapple with in order to earn their salaries.

"Most of what is aesthetically pleasing or not are the subtleties of proportions — the radii of the terminal's corners, the balance of the colors," says Don Donatelli, manager of product design for Sun Microsystems, Inc., based in Mountain View, Calif.

"Most of that is below what we call the perception threshold. People won't know why the machine is shaped a certain way and

won't consciously be aware of it, but subconsciously, it refers back to the system. The user hasn't seen it before, but it seems familiar," he says.

Matching typefaces, keys

The keys on the Sun-3 engineering workstation, for example, use a serif typeface to match the typeface of the Unix operating system commands on the screen. The keyboard itself is a sculpted, concave design to reflect the shape of the keys.

"The dished keyboard has no real function, but it reflects the function of the keys," Donatelli says.

"It's a specific cultural comment back to the product line. The keyboard also has palm rests, which few people use, but make the keyboard look more comfortable aesthetically," he adds.

Architects of interfaces

Designers view themselves as the architects of every interface between user and machine. Those interfaces, especially in products from a large systems vendor like DEC, mean much more than a data entry clerk's fingers on a keyboard or eyes on a screen.

A high-end VAX supermini encased in sheet metal may not have the exterior design flexibility of a VDT housed in molded plastic. But DEC designers work, in the words of Industrial Design Manager Rich Johnson, "from the inside out." These people play a large part in

the layout of internal CPU boards, power supplies, cooling systems and cabling connections.

'More human interface'

"Even at the high end, there is more and more human interface inside the skins of the computers," says Bob Hanson, an industrial design supervisor in Johnson's group.

"The biggest challenge is merging all of the functional aspects — thermal, acoustic, cabling. The machine should look just as nice with the door open — like looking under the hood of a new Corvette. It looks like someone cared," he says.

For some hardware companies, such as those who make IBM-compatible termi-

trying to push the frontiers of design, to innovate and still appeal to a mass audience. But it still has to be manufacturable, and at low cost. You can't build a computer like a Ferrari, looking great and costing a fortune."

Multivendor sensitivity

When striving for a unique corporate product image, designers must also be sensitive to multivendor environments.

"Half of our business is OEM," says Sun Microsystems' Donatelli. "It's important to have an aesthetic that's not too specific so it can be used in conjunction with other systems."

Design factors can be critical in the world of IBM Personal Computer-compatible clones, where packaging and price are often the only factors distinguishing one vendor's products from another's.

"Our design goal is simplicity," says Ted Papajohn, industrial design manager for IBM-compatible market leader Compaq Computer Corp.

"Less detail means fewer specs, which means less production cost. Most important, you can't go into 21st-century designs and set yourself so far apart that you can't sell it. If you intimidate the user, you've automatically lost a sale," Papajohn says.

Design sets Compaq apart

But Compaq also sought a micro design that would set it apart from the company whose functionality it emulates: IBM. "We tried to avoid their color scheme, their forms and their configurations," Papajohn notes. "And we've tried to keep each of our products in a consistent context with the others."

Papajohn's bent toward consistency is echoed in Maynard, Mass., where DEC's "one company, one architecture" corporate message is the modus operandi of President Kenneth H. Olsen's minicomputer empire.

That philosophy touches all three design groups at DEC, but it touches graphic design most of all. From labeling a shipping box to developing an Arabic-language keyboard, the goal is product line continuity.

"There was a time when just about every DEC product looked different," says Charles Conn, who was hired as DEC's first graphics designer in 1978 and is now graphic design manager.

"Now it's important to maintain continuity in everything, even something as seemingly insignificant as a regulatory marking. We're responsible for corporate identity. Sales brochures and posters come and go, but products are the essence of the company," Conn says.

”

'The machine should look just as nice with the door open — like looking under the hood of a new Corvette. It looks like someone cared.'

— Bob Hanson
Digital Equipment Corp.

nals, product design is an essential component of differentiating a vendor from its competitors.

Design was neglected

Wyse executives, beginning with founder and President Bernard Tse, attribute much of the company's early success to design factors.

"The aspects of ergonomic and industrial design were neglected in this industry," Simpson says.

"Detached keyboards, for example, were unheard of eight years ago. Even in our very first products, we asked questions about who is using it, in what environment and what are his needs?"

Apple lessons

Steve Holtzman, Wyse's director of product marketing, is a former Apple Computer, Inc. marketing employee. He says that the limited corporate acceptance of many Apple products can be partially blamed on design.

"Steve Jobs used to say that we should design products for ourselves," Holtzman says, "and we developed products with small screens and a lack of cursor keys — features that the corporate community was not willing to accept."

Industrial designers often tread a thin line between a suitably creative and an overly radical design.

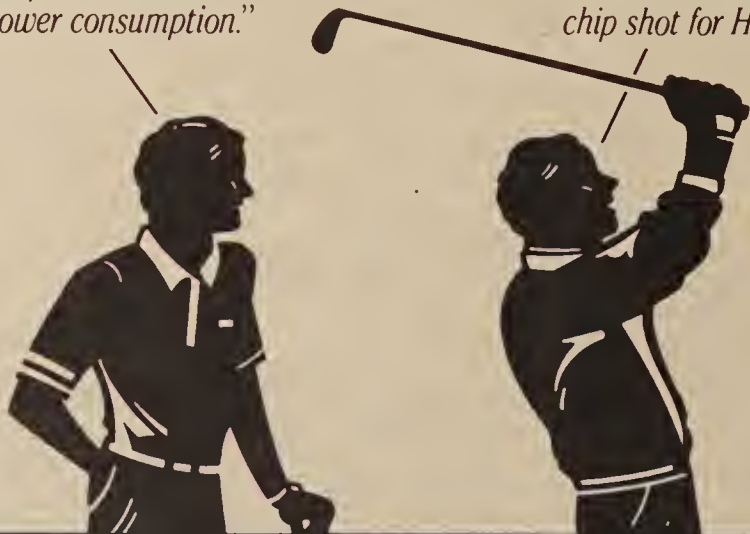
"The WY-50 terminal was very radical but was accepted in the marketplace," Holtzman says. "We're still

**St. Louis
Senior High-Tech
Specialists**

**Look for us in the
classified section.**

"What I need is a high-speed CMOS microprocessor with low power consumption."

"That's an easy chip shot for Harris."



**FOR YOUR INFORMATION,
OUR NAME IS
HARRIS**

For more details on what our advanced integrated circuits can do for you, call 1-800-4-Harris, Ext. 19.

HARRIS

NEWS

Group sets Pick standards, hopes to increase compatibility

Produces SMA/Basic, magnetic media norms

By Maura McEnaney

SAN DIEGO, Calif. — The first set of software standards for hardware manufacturers implementing versions of Pick Systems' Pick operating system was released last week by the Spectrum Manufacturers Association (SMA).

The standards are an attempt by a group of 17 hardware manufacturers, systems integrators and OEMs that license the Pick operating system to promote the use of their Pick-based hardware. Although Pick is known for its Unix-like portability across a wide range of hardware systems, a variety of implementations have diluted systems compatibility, vendors admit.

The SMA standards include the implementation of SMA/Basic, an extended version of the existing Basic language as it has been used on the Pick system. SMA/Basic includes Basic programming language definitions for programming functions such as accessing file structures, accepting input information and preparing reports.

A second category is a magnetic media interchange standard that defines the way data is written onto ½-in. magnetic tape, ¼-in. cartridge tape or a 5¼-in. floppy diskette. Under this standard, users will be able

to interchange compatible media between a variety of Pick-based systems. SMA vendors will have 18 months to conform to the standards. Standards on retrieval languages, terminal services and a third miscellaneous group are expected in about a month.

For Pick users like Larry Walton, data processing manager of Family Fitness Centers in San Diego, the emergence of Pick standards means he may one day be able to run the same application across his Pick-based hardware without having to spend time making several format changes.

Family Fitness Centers uses Pick with its Prime Computer, Inc. 450-II,

an Ultimate Corp. 3030 minicomputer, General Automation, Inc.'s Zebra 3750, 3500 and Zebra 2500 microcomputers and several IBM Personal Computer XTs to keep track of memberships at its 22 health clubs.

"The communication between these different computers has been very difficult," Walton notes. "The SMA standard is going to mean that I can port my applications more easily across these different systems."

Converting Pick applications from an Ultimate to a McDonnell-Douglas Computer Systems Co. machine may now take about three days, notes Gus Giobbi, president of the International Data Base Management Association, a for-profit organization for Pick us-

ers and the administrative arm of the SMA. But once the vendors implement the standards, users of new systems will be able to convert almost automatically, he said.

Chandru Murthi of Op Sys consultants in San Francisco says the emerging set of standards is one of the best things that has ever happened to the Pick community. "Until recently there has been a tremendous rivalry between Pick vendors to cut up pieces of the same pie. Now they are trying to make that pie bigger," he says. The SMA standards will not make current Pick systems obsolete but instead will give users more freedom to buy from different vendors, Murthi adds.

DIGEST from page 12

 **LONDON** — UK Department of Trade and Industry (DTI) officials will hold an emergency meeting with U.S. counterparts to resolve the wrangle over a Cray Research, Inc. Cray 1 supercomputer ordered by the University of London Computer Center. The U.S. refused to issue an export license to ship the supercomputer until the university signed an agreement forbidding access to it by Eastern bloc and Chinese nationals.

But the university's computer center last week told the DTI that it could not restrict access to the computer and accused Washington of blackmail.

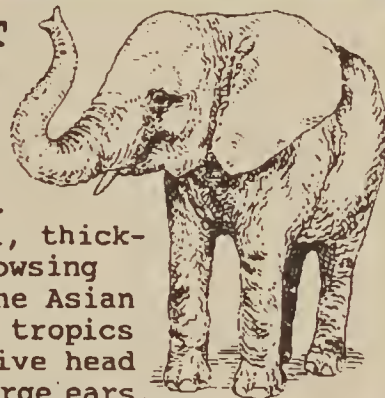
 **OSAKA, Japan** — Sanyo Electric Co., a latecomer to the Japanese compact disk (CD) market, has recently doubled CD manufacturing capacity to 10 million units a year, anticipating further build-up to 1.5 million by this summer. Sanyo, which dove into CD in mid-1983, is also considering increasing the production of CD read-only memory devices.

ELEPHANT.

The world's largest and most powerful living land mammal. It is a tall, thick-skinned, browsing animal of the Asian and African tropics with a massive head and body, a long trunk, large fanlike ears, and ivory tusks. The elephant belongs to the order Proboscidea, a name which refers to its most characteristic feature, the trunk (a word derived from the French trompe, meaning trumpet or proboscis).

ELEPHANT

The world's largest and most powerful living land mammal. It is a tall, thick-skinned, browsing animal of the Asian and African tropics with a massive head and body, large ears,



Other OCR systems

The JetReader™

WHY GET JUST WORDS, WHEN YOU CAN GET THE WHOLE PICTURE.

Introducing Datacopy's JetReader™

Often business communications demand that documents be prepared combining both text and illustrations. Now with JetReader there is a high quality, low cost OCR system for your personal computer that lets you do this quickly and conveniently. The JetReader reads output from virtually any printer as well as graphic images and illustrations.

The chart shows the JetReader's capabilities. And it lets you compare its very affordable price of \$2,950 to other OCR systems.

Datacopy's JetReader system comes complete with software for reading both text (OCR) and images

	WP/Compatible Formats	Multi-Page Autofeed	Learns New Typestyles	Word/Image Software	Price
Datacopy JetReader	7	✓	✓	✓	\$2,950
Kurzweil	2	✓	✓		\$36,500
Compuscan	2	✓			\$5,695
Dest	5				\$2,885

(WIPS™). It also includes seven word processing formatters for converting the data scanned into a format compatible with the most popular word processing programs. If your favorite isn't included, our basic formatting programs will work for you.

We realize that you work with documents that are more than one page in length. Our scanner accepts up to ten pages, and then automatically reads each one, accurately creating a data file from the printed information.

When you purchase the JetReader system with OCR Plus, you get the added capability of having an OCR system you can train to read the font, style, and language used in your business. That is, of course, if it's not already included

in the long list of typestyles the system is factory-trained to read.

Call today to get the whole picture.
1-800-556-1234
(Inside CA please call 1-800-441-2345) and ask for extension 96.



DATACOPY

JetReader.™ When words aren't enough.

Announcing
Computerworld's
MICRO DIRECT SHOPPER

SEE PAGE
125

VIEWPOINT

EDITORIAL

Leading the charge

DP/MIS managers, haunted by memories of being bystanders rather than generals in the microcomputer revolution, like to believe they have taken to heart the battle cry, "Never again!" They are currently being handed an excellent opportunity to prove their mettle and the worth of their new role as corporate information systems managers.

The opportunity is presented by the emerging technology of in-house electronic publishing, examined at length in this issue's Executive Report. Electronic publishing has disturbing echoes of the micro experience: It, too, captures a technology traditionally outside the DP/MIS purview. It, too, raises the critical issue of who will take the lead in evaluating, choosing, installing and controlling these new systems, whether desktop or corporate wide.

There is no question MIS managers are best suited to the task. Like microcomputing and now voice communications, electronic publishing is clearly an extension of a company's information flow. Like them, it significantly affects a company's bottom line: Computer-based systems promise to cut in half document production expenditures that typically account for 6% to 20% of a company's gross revenue. And it requires the ability to link components from various vendors to create a truly workable, integrated system.

Already many MIS executives are being questioned: Personal computer users inquire about laser printers; departmental managers demand new tools to quickly update technical documents; top executives want figures on how much in-house publishing could cut costs and reduce document turnaround time.

Now is the time for MIS executives to seriously consider such questions, provide the answers and move quickly to develop a consensus within general management that effective production of hard copy is an integral part of an overall information-processing strategy. They should, in short, boldly lead the charge in adapting this promising new technology.

Seizing initiative here could do much to dispel the notion that MIS too often follows rather than leads.

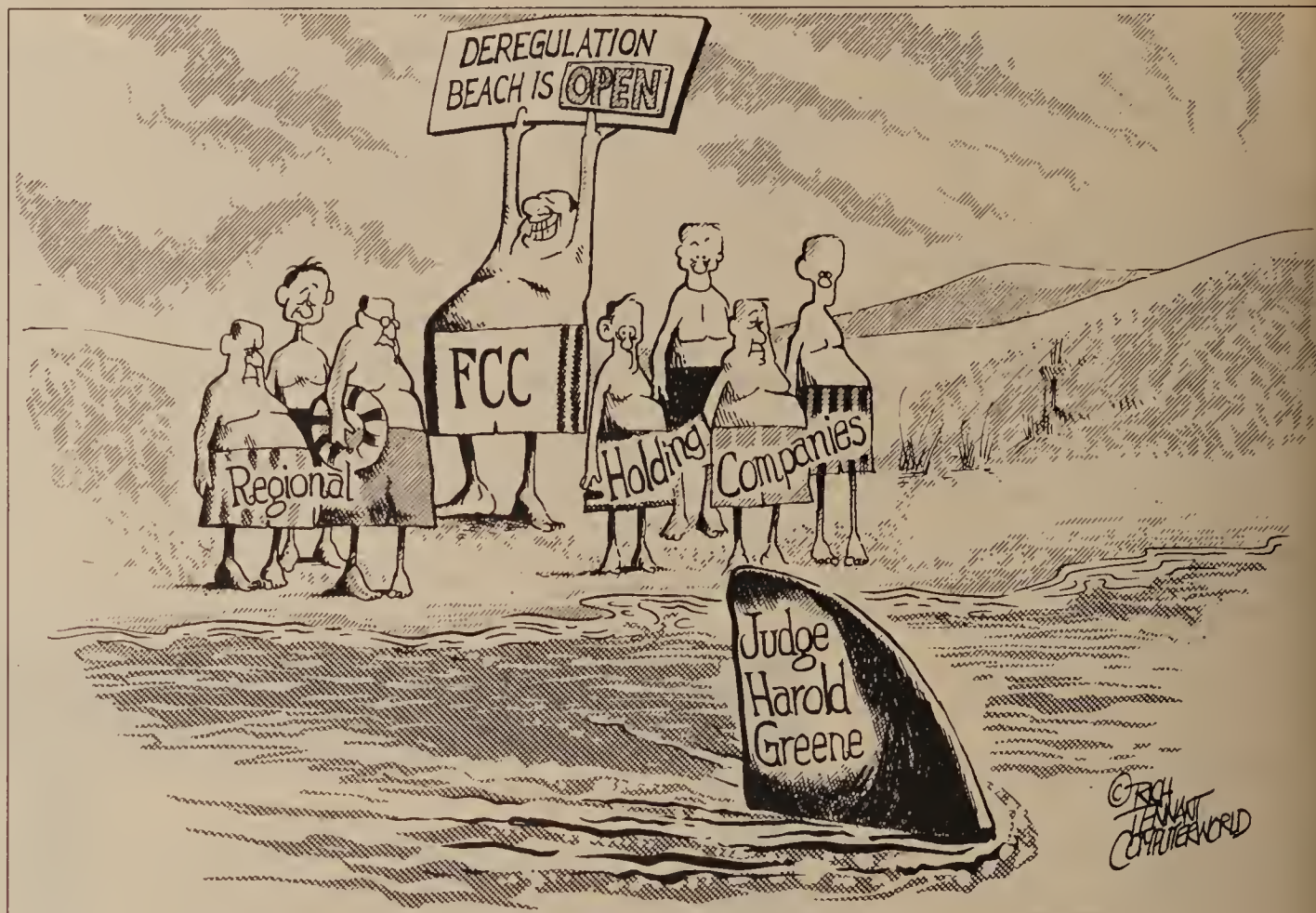
Notes & observations

Among the clear signals to the IBM user community contained in last week's exclusive *Computerworld* interview with Entry Systems Division President William Lowe were several deserving both comment and support.

The most important of these was Lowe's commitment to IBM's existing Personal Computer customer base, as the company expands its product line. "We're intent on providing a set of open interfaces, which will be on the PC as well as the intermediate and large processors," Lowe said.

His commitment to connecting the PC to larger IBM systems augurs a day when customers can have transparent data communications from the smallest to the largest IBM system.

True, all of this must be proven in the act. But given that Lowe speaks rarely in public, his considered words to *Computerworld* must be greeted with optimism and encouragement.



LETTERS TO THE EDITOR

Users, IBM see merits of System/38

It was nice to read the System/38-related articles, "Mid-line crisis" [CW, April 14] and "System/38 grows up" [CW, April 21], particularly the latter. The press has historically done a very poor job of explaining the System/38 to the data processing community. This may become more important now that IBM staff members are saying publicly in various forums that the System/38 will be assuming a more strategic role.

Several reasons have been mentioned for this new positioning aside from the merits of the System/38 itself. The System/36 is based on an obsolete design (the IBM 360, not 370) and doesn't have the power or flexibility needed. An air-cooled 4300 still requires support and staffing that is too expensive and scarce for the small and medium-size shops. Perhaps most important, the Japanese and others can produce high-quality plug-compatible versions of the 4300 for less money than IBM. By committing to the closed architecture of the System/38, which would be almost impossible to duplicate, IBM will ensure a protected source of revenue in a key market.

Many of us who work with the System/38 think that it's the best business computer that IBM makes. It just took IBM a while to realize that too.

Bill Horowitz
Chesebrough-Pond's, Inc.
Trumbull, Conn.

Controlling the surprise factor

The recent article by Neal Margolis, "High user overhead mars interface design" [CW, April 28], contained some excellent information.

The article's key point is an important one: In order to determine a product's success, it must be tested to the user's needs, not merely to the requirements. However, if the requirements don't represent the user's needs, who is it that is responsible for the surprise? The tester or the software producer?

Performing some sort of testing to identify the user's needs up front while developing the requirements specification (a technique that may include prototyping) is certainly a good idea. That kind of testing is a discovery process ("Try this. Did you like it? How about this?").

Testing applied during the development of a product, intended to uncover bugs, is a comparison

process ("Do this. Did that happen?"). This kind of testing has to be rigorously based on the products generated during the development life cycle or else the correctness of the product degenerates into a matter of opinion. Correctness means that the downstream products do what the upstream products describe. That's high quality.

A wise software developer would be worrying about how to test the specification at the same time as the specification was being written.

But testing developed and performed after the fact will only reveal surprises — surprises that will be very expensive to eliminate. The choice of which approach to take is the software producer's, not the tester's.

Software producers are responsible for the quality of the product. The quality assurance measures they take, including deciding when and where to test, determine how much surprise a software product will carry.

I realize that software developers may be tired of hearing about quality assurance. Worse than auditors who at least have the law behind them, quality assurance people (a.k.a. the program police) depend on moral imperatives to induce software producers to make decisions about the level of surprise their products will carry. These days I've taken to calling quality assurance "surprise control."

How much surprise can a product contain and still sell in the marketplace? That's the key question that software producers have to answer. The more differences between what the product does and what they specified it would do, the more inherent surprise there will be in the product. That surprise costs more to the producers in support and more to the users in overhead. And it may mean the difference between a product that sells well and one that sits on the shelf.

It's not the tester's responsibility to set the level of surprise. That's the software producer's job.

Margolis is correct: The focus of the software producers should be on the performance of the users. If they can't express the users' needs in a complete specification of the users' requirements, then the best product will not be built, despite the best efforts of testing. Don't blame poor quality on bad testing. It's more likely to be the result of poor product definition (too much "surprise allowance"), clearly the software producer's responsibility.

Mac Patrick
Pacific Bell

Get off the route slip circuit!

Order your own subscription to **COMPUTERWORLD** — each issue costs about what you'd pay for a morning's cup of coffee.

Just 86¢ an issue! Plus, a **FREE Desk Top Solar Calculator** with your paid subscription.



**Fill out and mail in the attached
postage-paid envelope.**

YES... I'll take COMPUTERWORLD — one full year (51 weekly issues) for just \$44. And I'll receive my Desk Top Solar Calculator FREE with my paid subscription. (Allow 6-8 weeks for shipment of your calculator.)

- [illegible]

[illegible]

Address shown: ☐ Home ☐ Office

- ☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate. (Attach mailing label above.)

Canada, Central & South America \$110/ Europe \$165/ All other countries \$245 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for the special introductory rate.

Please indicate your business, function, and computer involvement below.

- 1. BUSINESS INDUSTRY (Circle one)**
10. Manufacturer (other than computer)
11. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Public Utility/Communications Systems/Transportation
70. Mining/Construction/Petroleum/Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer Service Bureau
90. Computer Planning/Consulting
95. User: Other
- 2. OCCUPATION FUNCTION (Circle one)**
11. President/Owner/Partner/General Manager
12. VP/Assistant VP
13. Treasurer/Controller/Financial Officer
21. Director/Manager/Supervisor DP/MIS Services
23. Director/Manager of Operations/Planning Admin. Serv.
31. Systems Manager/Systems Analyst
31. Manager/Supervisor/Programming
32. Programmer/Methods Analyst
35. Data Comm. Manager/Supervisor
36. Data Center, Network, Systems Mgmt.
41. Engineering/Scientific/ R&D/Technical Mgmt
51. Manufacturing Sales Reps/Sales/Marketing Mgmt.
60. Consulting Management
70. Medical/Legal Accounting/Mgmt
80. Educator/Journalist/Librarian/Student
90. Other

VIEWPOINT

Retrofitting employees: Human costs of automation

It's hardly news that automation destroys some jobs. One of the prime motivations for automating, after all, is to cut labor costs. It's true, too, that automation creates new jobs: If automation only destroyed jobs but didn't create any, then we'd expect to find most people out of work today, since a high percentage of the jobs of two and three decades ago have been changed or eliminated through automation.

Some of the people who are paid to worry about social, political and economic issues, however, fear that the rate at which automation will destroy jobs is going to increase and that newly created jobs will be offshore. In fact, few of us are immune to automation. Job loss in the future could conceivably grow to include us so-called knowledge workers. Fourth-generation languages probably haven't made any programming jobs disappear yet, but as artificial intelligence becomes a real, money saving tool in more jobs, it's sure to displace some white-collar professionals. The finance field, for example, is ripe for AI tools to replace some money managers, investment analysts and merger-acquisition specialists.

The U.S. is becoming more and more an information society, in which the basic commodity employees produce and manipulate (that is, add value to) is information. And communications technologies, such as satellites and fiber optics, make it much easier than in the past to move those jobs offshore.

How do we — employers, government, unions, employees and citizens voting on social policy legislation — deal with these realities?

Blind resistance won't work. In the long run, it's self-defeating, a guaranteed way of pushing jobs offshore.

In the 1950s and 1960s, for example, auto workers' unions tried to preserve members' jobs via a strategy that was, in practical terms, near-blind resistance to automation. Look out your window into the company parking lot if you want to see how well that strategy worked. We have only to look around us to see how many products — particularly those containing any kind of electronics technology — are produced offshore by foreign workers. In my office, for example, my IBM Personal Computer is one of the few products I see that was made here. Many jobs — by no means unpleasant, dangerous jobs — have been moved offshore permanently.

The reasons are simple. Production and technology are mobile. Com-

petition today is no longer merely nationwide, it's worldwide. It's no more expensive (and frequently less so) to produce a product in, say, South Korea, as in South Bend.

Fortunately, there are indications that all segments of society are beginning to look at automation and job loss much more pragmatically. An AFL-CIO official told me that the trend in union contracts has been for more of them to include some provision for employer-paid retraining.

One reason that formal recognition of the need for retraining is significant is that it's becoming more clear that in the future, some of us might have as many as six or seven careers during our work lifetime. In other words, it will behoove us all to start thinking about some form of retraining for the future.

I suspect that within the next decade, we'll regard it as an employer's obligation

to make some provision to retrain technologically displaced employees; many companies today regard it as a good business practice.

IBM is probably the example that comes to mind most readily. According to an IBM spokesman, IBM's policy from its founding, called the Full Employment Practice, has been that no worker will be let go for economic reasons such as a general downturn in the economy or plant automation. IBM's average spending last year for employee training and retraining was somewhere in excess of \$2,200 per employee — for a total training bill in the hundreds of millions of dollars. (That figure includes all training, not only retraining of those displaced by automation.) Digital Equipment Corp. has a strong tradition, though not a corporate policy, of no layoffs arising from economic considerations such as automation, according to a DEC spokesman.

'We'll retrain you at our expense'

Look at the message implicit in a retraining commitment by employers. In effect, it says to employees, "Talk is cheap. Here's a concrete demonstration that we think you were all valuable contributors in the past. We don't want to lose any of you as a result of automation, so we'll retrain you — at our expense."

Indeed, if you believe that money talks, you could reasonably argue that IBM cares more about its employees than some states do about their citizens, in terms of per-capita spending for education.

Some very significant labor-saving, job displacing products from AI, robotics and other computer-based technologies can be expected to appear in the marketplace in the near future. Unless our society has thought through a coherent, practical, equitable policy for dealing with job loss, these technologies will be impeded — in which case, we'll all be losers one way or another.



By HOWARD A. KARTEN

When bankruptcy threatens software service contracts

Source code considered property to secure debt

Current bankruptcy laws' debilitating effects on software service contracts are demonstrated by a hypothetical example. Assume an OEM, Digital Business Technologies (DBT), wishes to acquire for sublicensing a computer program developed and owned by Thirty-One Flavors Software House.

DBT seeks assurance that Thirty-One Flavors will provide prompt debugging if necessary. To ensure continued service after fire, bankruptcy or other disruption, an escrow agreement calls for a third person or agent to hold copies of the source code. The source code will be delivered to DBT should Thirty-One Flavors fail to meet its service commitments.

Now assume Thirty-One Flavors goes bankrupt. A trustee in

bankruptcy is appointed to collect property for either reorganization or liquidation. If the source code held by the agent belongs to Thirty-One Flavors, it may not be transferred to DBT, and the trustee may demand its return. Further, any license or escrow agreement purporting to transfer the source code upon insolvency or bankruptcy may be voided.

Disruptive effect rooted in insecurity

Bankruptcy's potentially disruptive effect on software licensing is rooted in the developers' insecurity over their products: Software is vulnerable to piracy.

Software users and OEMs, however, require prompt service for developers' products that, in turn, may require source code access. The tension resulting from the developers' fears and the users and OEMs' service requirements has produced tortured licensing contracts and voluminous escrow accounts.

Most solutions seeking to avoid bankruptcy's disruptive effects attempt to characterize the source code as outside the bankruptcy process. The problem is that unless there has been a transfer of ownership before insolvency, Congress intended these transactions to be run through the bankruptcy process.

Use available protections

Another as-yet-untried alternative would utilize protections available in bankruptcy law to provide access to the source code for the user and OEM.

First, create a standard escrow agreement to hold the source code. Second, execute a security agreement, similar to the kind that pledges ownership in a house as guarantee for the obligation to pay a mortgage. Instead of using real property to se-

cure a debt obligation, however, the developer uses intellectual property to secure a service obligation. The developer's speedy service of the software is the obligation.

The intended effect of this legal contraption is best demonstrated through our hypothetical example. Assume the security agreement is executed and properly filed. DBT holds the limited-use license and access rights as a creditor in possession, meaning it cannot exercise the rights unless the developer defaults on its software service obligation.

The source code is safely in the hands of the escrow agent. Thirty-One Flavors is at no greater risk than under the old escrow-type agreements because no ownership rights have been transferred, and DBT may only see the source code if the software service obligation is breached.

Now assume Thirty-One Flavors goes bankrupt. DBT may first attempt to exercise the limited-use license and access rights to service the software itself. Because the developer is protected from piracy by the license terms and no ownership interests in the source code are being affected, the trustee might permit access and the agreements work as planned.

A wily trustee may, however, attempt to block DBT's access to the source code through a turnover order against the escrow agent. Alternatively, an automatic stay may prevent DBT from exercising the license and access rights because they are the developer's property being transferred to the user or OEM at bankruptcy. Under either a turnover order or an automatic stay, the true value of DBT's "secured creditor" status comes into play.

Entitled to adequate protection

However, as a secured creditor, DBT is entitled to adequate protection under bankruptcy law when either the turnover or automatic stay provisions operate against Thirty-One Flavors' pledged property. While this provision is not entirely clear, it seems to guarantee the creditor that pledged property will not depreciate in value during the bankruptcy.

Turnovers or automatic stays lessen the value of the pledged license and access rights. Should the adequate protection concept apply, the court must fashion a remedy to leave DBT on the same footing as before Thirty-One Flavors' bankruptcy. Such an equitable remedy might include permitting DBT to exercise its access rights, designating a third party to perform the software service or ordering payments to DBT for costs of replacement software.

With the secured creditor alternative the user or OEM receives immediate judicial attention and has some legal leverage to argue for immediate access to the source code, and thus the onus is on the developer's trustee to justify denial of the license and access rights.

READER'S PLATFORM

By IRWIN B. SCHWARTZ

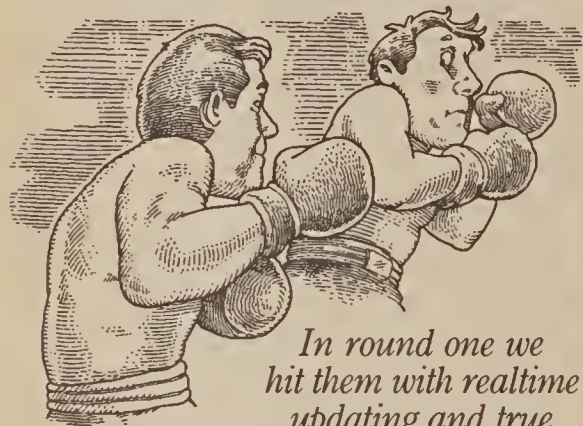
Schwartz is a third-year law student at Boston College and a law review editor there.

Now a writer and consultant, Karten has been involved with computers for two decades as a programmer, systems analyst and DP manager.

Financial Software Showdown Round 2

Computer Associates steps into the ring with a buyers check list and a free trial offer. Will anyone else answer the bell?

We recently published a Buyers Guide to financial applications software that opened a lot of eyes. Now we are coming back for round 2 with a do-it-yourself check list. If you are currently using—or thinking of buying—MSA, McCormack & Dodge, or any other financial software, find out if they can answer “yes” to each of these questions. You’ll quickly see how Computer Associates wins with Advanced Business Software.



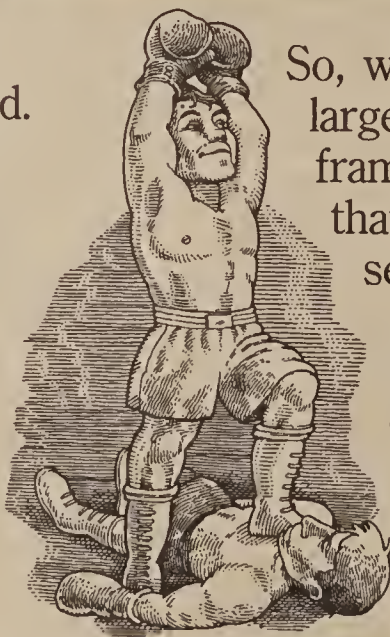
In round one we hit them with realtime updating and true product integration.

We’ll be surprised if anyone answers our challenge because we think no one else in mainframe applications software regularly delivers so much value and performance for anywhere near the price. We’re the ones that are young and fit—fit for the 80’s and beyond. The others are old and cumbersome. Their retrofitted layers of modifications make them true resource hogs that can make companies spend millions on new hardware just to cope.

In Applications Software, too . . .

The way is CA

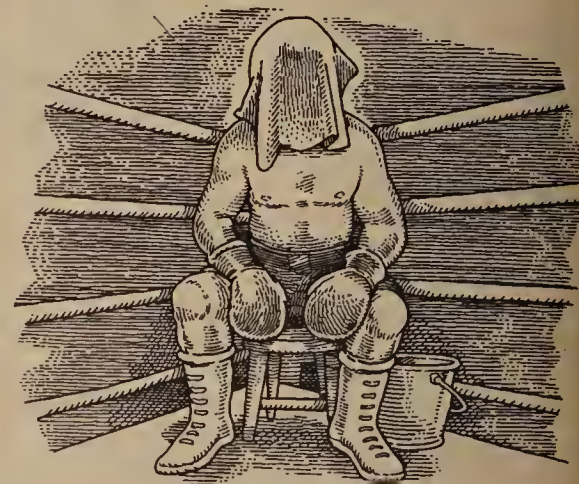
FINANCIAL SOFTWARE BUYERS CHECK LIST		
	Computer Associates Advanced Business Software	Competition
Do products perform all updates to the master files in realtime (the instant the information is entered)?	YES	
Is online access provided to this current, accurate information?	YES	
Are the products so completely integrated that changes in one are immediately reflected in all others?	YES	
On average, can the General Ledger be installed in under 2 hours?	YES	
Can implementation be accomplished without high priced outside assistance in as little as 3 to 4 months?	YES	
Does the vendor offer the opportunity to trial the product using your data and on your system?	YES	
Does the vendor offer user aids like online HELP and PC based tutorials?	YES	
Does the vendor offer on-site installation and on-site training at no additional charge?	YES	
Can the products be implemented without forcing a hardware upgrade and can they be maintained without significant additional personnel cost?	YES	



So, whether your shop is large or small, the mainframe financial software that makes the best sense for you is the fully

Our resource-efficiency punch scored a knockdown.

integrated, online Advanced Business Software solution supplied by Computer Associates. It’s the resource efficient, quick to install and implement architecture of today with easy, familiar operation utilizing industry standards throughout.



The punch that really hurts is the cost comparison. They might as well throw in the towel.

FREE TRIAL OFFER

Eliminate the risks in applications software selection with our free trial program that is unique in the industry. For qualified prospects with an IBM or plug-compatible mainframe, we will install any of our products in your data center for your review. It will cost you nothing and require minimal time of your staff to run our structured program. In just one week per product, you will be able to judge accurately the absolute superiority of Computer Associates Advanced Business Software.

For more information, call 800-645-3003 and ask for Dana Williams.

COMPUTER ASSOCIATES
Software superior by design.

711 Stewart Avenue, Garden City, N.Y.
11530-4787



SOFTWARE & SERVICES



SOFTLINE
Bob Didner

Changing the programmer

Programmer productivity is like the weather: People often discuss it, but to date, very little has been done about it.

Why have the so-called fourth-generation languages not delivered on their promise of a tenfold improvement in programmer productivity? And why is it that a profession that has learned to make programs run faster cannot do the same thing for the application generation process?

Perhaps it is because we are not applying the same techniques to programmer productivity as we have to program efficiency.

Programmers approach enhancing program efficiency by identifying the part of the code that the computer spends the most time executing. Perhaps the same approach can be applied to the realm of programmer activity. The industry has generally agreed where most programmer activity is spent. Between 50% and 80% is spent with non-bug-related modifications, including maintenance and user interface coding.

User interface changes in particular are one of the greatest causes of nonbug maintenance. Consider two ways that this time-consuming area of user interface design may be improved.

The first way is to use a fourth-generation language, or prototyping tool, that allows the designers to define

See **CHANGING** page 25

Didner, president of Decision Information Designs of Morristown, N.J., is a consultant specializing in systems analysis and human factors engineering.

SI adapts software to VAX

Masterpiece series merges data between applications

By Charles Babcock

ANDOVER, Mass. — A family of on-line accounting and business applications software formerly restricted to IBM mainframes and System/38s has been converted for use on Digital Equipment Corp.'s VAX line.

Software International Corp., the \$40 million-a-year software subsidiary of General Electric Information Services Co., announced today that its general ledger, accounts payable, accounts receivable, fixed assets and payroll applications will be offered as the Masterpiece Series VAX at prices ranging from \$16,000 to \$42,000 per application.

Although Software International previously marketed some applications for the VAX line, its Masterpiece Series VAX is made up of mutually interfacing products, said Frances Y. J. Wheeler, a company spokesman.

When Masterpiece is combined with the version of Masterquery designed for the

VAX, a user can access information in one application and merge it with information from another in a report or query, according to Wheeler. Masterquery uses English-like statements to access data in applications and make up reports.

Spokesmen said DEC is a user of Software International's financial software, and the two companies have jointly marketed applications for several years. Masterpiece Series VAX can run on any VAX from the 8600 series to the Microvax II.

Jeff Papows, marketing manager, said the Masterpiece general ledger application takes full advantage of the on-line capabilities of the VAX. Last-minute closing entries can be made, with the effect on postings at all levels quickly evident, he said.

The Masterpiece accounts payable application offers on-line data entry and cash requirement and commitments. Accounts receivable offers on-line access to comprehensive account activity and history to support the credit approval and collections processes.

Also included in Masterpiece is VAX Mastersecurity, which gives authorized users access to multiple applications

See **SI** page 25

INSIDE

New programming tools are coming out aimed at increasing corporate use of expert systems/24

NEW THIS WEEK

■ Swanson Analysis Systems ports Ansys to DEC Vaxstation II/GPX

■ For more on this and other new products, see pp. 85-107.

INSTANT ANALYSIS

"IBM throws grenades over the wall, and you just have to keep throwing them back."

— John Cullinane, chairman of Cullinet Software, Inc., on DBMS product competition at a recent Hambrecht & Quist, Inc. security analysts meeting

SOFTWARE NOTES

Unix release takes aim at business

Release 3.0 of AT&T's Unix System V, due out in mid-June, has been designed to make Unix more attractive to business users, according to Bill O'Shea, executive director of the Software Systems Division at AT&T Information Systems. Release 3.0's Streams feature will enable users to run applications independent of the underlying network. It separates the application interface from the protocols for communications and networking, so an application running on AT&T's Starlan one day can run

See **ADR** page 23

Orion unveils development aid

By Eddy Goldberg

BERKELEY, Calif. — The Orion Group, Inc. has released the Orion DIA Facility, a software package that will enable third-party vendors to develop business applications that support IBM's Document Interchange Architecture (DIA) directly through LU6.2.

The product represents the emergence of software applications for IBM's LU6.2 peer-to-peer communications protocol.

"Many people have been concerned that LU6.2 without any software only represents a potential. With IBM's current offerings, there are no applications to run on Advanced Program-to-Program Communi-

See **ORION** page 23

ELECTRONIC MAIL COMMUNICATION CENTER

Lightyears Ahead ...

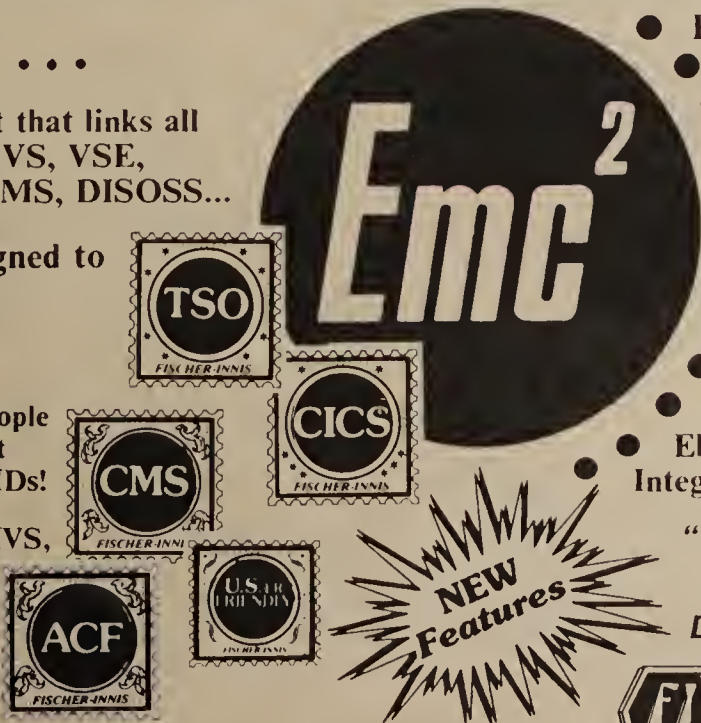
The ONE electronic mail product that links all major operating environments: MVS, VSE, VM, CMS, CICS, TSO, ACF, IMS, DISOSS...

Emc² is easy to use. It's designed to get the mail moving fast.

Emc² functions as a super-efficient ACF/VTAM application.

This allows literally thousands of people in your company to use mail without needing TSO, CICS, or CMS user IDs!

The Fischer-Innis Virtual System, FIVS, lets VM/CP installations efficiently support a very large number of Emc² users, with minimum added administrative overhead and drain on CPU and DASD resources.



- Full-screen menus and help panels
- Scrollable inbaskets and outbaskets
- Uncomplicated text entry
- Mailing lists
- Bulletin boards
- Calendar features
- Timely Reminders "tickler file" (arrange for messages to be sent at some future date)
- Automatic new-mail notification
- Mail classes (partition Emc² into virtually separate mail systems)
- Efficient data base storage
- Simple installation
- Low administrative overhead
- Application programming interface
- Electronic mail networking between mainframe sites
- Integrated PC support and integrated PC file transfer

"Re-transferable electronic forms" — easy to create; display them, fill them out, send them.

DISOSS interface.



**FISCHER
INNIS**
SYSTEMS CORPORATION

CALL TODAY FOR MORE INFORMATION,
OR TO SET UP A FREE TRIAL: 800-237-4510
In Florida, call 813-793-1500

4175 MERCHANTILE AVENUE • NAPLES, FLORIDA 33942

Achieve Full Integration For Your Corporate PC... With The SAS® System Under PC DOS.

One Integrated Solution For All Your Company Needs.

Now, you can have an information system that offers solutions for all of your company's needs. Data management and retrieval. Statistical analyses. Report writing. Applications development. And

more. All in one product.

And you can use it in every department and for every application. Data entry. Business reports. Text processing. Statistical summaries. With the PC SAS® System, decision-making, record-keeping, and analysis are standard and simple.

One Solution With Complete And Powerful Features.

The same high-quality software for mainframes and minicomputers is now available for PCs. And it offers features as rich as any mainframe system you've seen. A data manager. A full-screen text editor.



A windowing facility. Complete data manipulation and statistical procedures. A display manager (to edit, display and control output from your PC). An interactive programming facility. A front-end menuing system that you can customize. With the PC SAS System, you get the power of the mainframe and minicomputer SAS System. And more.

One Solution For Your Micro-To-Mainframe Link.

Now, you can link your PC to your mainframe. With the same system at both ends of the link. You can download data to your PC. Or develop and test applications on your PC. The PC SAS System reads data from programs like dBASE II, dBASE III and LOTUS 1-2-3. You can enter data on your PC, submit your job to the mainframe, execute it, and view the results on your PC. Or you can download data from the mainframe, add and

revise, and send the new data to the mainframe for job execution or storage. Regardless of which system you use, the language, syntax and commands are identical.

One Solution That Is Remarkably Friendly.

Now, one system offers special features like programmable "pop-up" windows that make "friendly" a term you can understand. Use these windows to program function keys. To create "help" messages. To check the variables in your data set. And these windows can handle practically any utility you need. In fact, the PC SAS System is so friendly anyone in your organization can use it.

One Solution With Site Licensing And Full Support.

At last, you can have the information system for your PC you've always wanted. With the advantages of site licensing. You

license the PC SAS System on an annual basis. You get all updates automatically. And at no additional cost.

The PC SAS System is also fully supported. Documentation accompanies delivery. Technical support is provided by phone or mail. Full customer training is offered. And it's all available from SAS Institute.

The Solution For SAS Power On Your Corporate PC. Now.



SAS Institute Inc.
Box 8000, SAS Circle
Cary, North Carolina 27511-8000
Telephone: (919) 467-8000, ext. 280
Telex: 802505 SAS RAL





EVEN IN OUR EARLIEST DAYS, OUR EMPLOYEES EXHIBITED LEADERSHIP.

Four score and seven years from now, will the company that sold you your business software be around to fix a problem?

Promises don't count. You have to look at a company's actual history.

At McCormack & Dodge, we're in the unique position of having two histories, both distinguished, to submit for your consideration.

One is our own, dating back to the 1960's,

when we began as a one-package software house in the Boston area. Through leadership technology, we grew to be a global company, serving the world's greatest corporations with a broad multi-package software line.

The second history belongs to our parent, Dun & Bradstreet. It dates back to pre-Civil War days, when one Mr. Lincoln worked as a D&B credit correspondent.

No American company has a better history of stability than Dun & Bradstreet.

Put this proven stability together with the proven technology of McCormack & Dodge, and you have something unique in the software industry.

A supplier whose strength eases your mind when you worry about the years ahead. Even if it's four score and seven of them.

McCormack & Dodge

DB a company of
The Dun & Bradstreet Corporation

McCormack & Dodge Corporation, 1225 Worcester Road, Natick, MA 01760, 1-800-343-0325

ADR plans to convert tools

From page 19

without changes on Ethernet the next by swapping Streams modules. It also features Remote File Sharing, which treats all files on the network as if they were a local file system, O'Shea said.

Applied Data Research, Inc. (ADR) has made it official. It says it will convert its Dataquery end-user query language and Ideal fourth-generation applications development system to be used

with IBM's DB2 and SQL. At the same time, President Martin A. Goetz says ADR's data base management system Datacom/DB and Ideal "has a number of proven, superior capabilities over DB2."

IBM's mainframe security product RACF has been improved recently, thanks to the pressure of competing products and the lobbying of RACF users' groups, says Stuart C. Henderson, organizer of a new RACF users group in New York. The New York RACF User Group is the third such association in the country, joining groups in Chicago and Southern Cal-

ifornia, according to Henderson, who is vice-president of Prudential Bache Securities, Inc. Henderson can be contacted at 57 Fairfield Ave., Cranford, N.J. 07016.

Uniq Digital Technologies Co. of Batavia, Ill., will support Digital Equipment Corp. VAX sites that are running Unix System V purchased in source code from AT&T. It will also port future releases of AT&T Unix System V to the VAX series. AT&T Information Systems has announced its intent to end support to VAX System V source code customers on March 31, 1987, Uniq Digital Technologies officials said.

Bank of America is offering a treasury management package for mid-size companies, the \$995 Microstar Corporate Cash Planner. With the addition of communications software, the package allows a corporate treasurer to produce up-to-the-minute reports on cash balances on an IBM Personal Computer.

The package was developed by Seafirst, a Bank of America subsidiary, which has marketed it since last year. Bank of America and other banks compete to provide software to corporate treasurers as a way of building long-term customer relationships.

Tricom Automotive Dealer Systems, Inc. of Hayward, Calif., is a little company with a big break. Tricom has signed a long-term, exclusive vendor agreement with IBM

under which IBM will market Tricom's System/36 Automobile Dealership Management System in the U.S.

Dallas Talley, Tricom president, said the value of the agreement over its undisclosed term "represents potentially 10 times the size" of the firm's revenue last year.

BMC Software President John Moores told the first meeting of the BMC User Group in Houston on May 16 that BMC has begun work on enhancement products for IBM's DB2. Its product line, to date, has sought to enhance CICS, IMS, VM and VTAM.

The second BMC User Group meeting is scheduled for April 29 to May 1 in Houston, according to Marianne Levandoski, steering committee spokesman and senior systems programmer at AT&T in New Jersey.

TSO LISTJES

JES2 & JES3 SYSOUT PREVIEWER

NO JES MODIFICATIONS

- Operates with or without ISPF
- Selective Print, Delete & Requeue
- Supports Line, 80 & 132 column terminals
- User Exit for Security & Control
- MVS & XA support
- 9 Additional TSO Utilities
- Full product support since 1980
- Free one-month trial

Call or write for details:

Applied Software, Inc.
840 U.S. Hwy. #1, Suite 250
North Palm Beach, Florida 33408
(305) 626-4818

Over 500 Customers Worldwide • Quality Software Since 1973

Orion offers facility

From page 19

cation," said Orion President Paul Rampel.

The Orion DIA Facility provides distribution services, which allow documents to be distributed to network users; access to library services, which provide connectivity with IBM's Distributed Office Support System (Disoss)/370; and applications services, which allow documents to be transformed at the host site by an applications program.

The facility also provides file transfer services, which enable documents to be exchanged directly between network nodes without requiring the services of the central host.

Rampel said the Orion DIA package provides OEM customers with a menu-driven end-user interface. "You don't even know you're using DIA, except that you're talking to computers that use it," he said.

Rampel added that LU6.2 is the most efficient way to access Disoss.

Optional enhancement

The package is offered as an optional enhancement to the Orion Peer Communications Facility, which was introduced last September and supports IBM's LU6.2 and Physical Unit 2.1 [CW, Sept. 23, 1985]. However, it can work in conjunction with other LU6.2 products, such as IBM's Token-Ring, Rampel said.

Included in the package is a completed application, written using DIA function calls, that emulates the electronic distribution system of the IBM Displaywriter.

The package is available immediately for Unix-based systems and can be adapted for other operating environments.

It will be sold on a royalty basis to OEMs and systems integrators.

San Jose Senior High-Tech Specialists

Look for us in the classified section.

ALLTAX®

The Most Widely Used Payroll Tax System in North America.

The ALLTAX Taxing System, a software package from Management Science America, Inc., calculates all U.S. and Canadian payroll withholding taxes.

- ALLTAX decreases the amount of time spent on tracking, interpreting, and implementing tax changes.

- ALLTAX delivers timely updates to the System as tax changes occur.

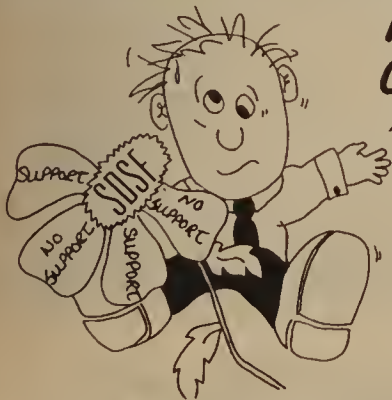
- Formulas for all supported taxing authorities are provided in the System and Documentation.

- ALLTAX provides ongoing telephone support whenever you have a question or need assistance.

ALLTAX is a proven software product, having been in the marketplace since 1966.

To learn more about ALLTAX, call Kerry Engle at 404/239-2030.

MSA
The Software Company



IBM DRIVING YOU CRAZY WITH SDSF??

REPLACE SDSF AND ISPF 3.8 WITH FLASHER

FULLY SUPPORTED ALL THE TIME

- | | |
|-------------------------------|------------------------|
| □ INSTANTANEOUS JOB RETRIEVAL | □ MENU JOB SELECTION |
| □ ISSUE OPERATOR COMMANDS | □ VIEW ACTIVE SYSLOG |
| □ SELECT INDIVIDUAL DATASETS | □ ON-LINE HELP SCREENS |
| □ VIEW JOBS IN EXECUTION | □ DISPLAY LINE COUNT |
| □ SELECT MULTIPLE JOBS | □ REAL SPF/ISPF BROWSE |
| □ JES2 AND JES3 | □ SECURITY |

FOR ADDITIONAL INFORMATION OR FREE TRIAL CALL:

1-800-833-8663
or
714-991-9460
in Calif.

TONE
Software Corp.
1735 S. Brookhurst
Anaheim, CA 92804

SOFTWARE & SERVICES

AI offerings aim to accelerate adoption of expert systems

Language rewrites ease integration

By Eddy Goldberg

Artificial intelligence companies are offering a set of products intended to speed the use of expert systems in corporations.

Teknowledge, Inc., in a move to bring its expert system software products into the commercial mainstream, has rewritten its product family in the C programming language. The new versions are intended to help create expert systems that work with a company's business applications.

One Teknowledge product, S.1, rewritten in C from a LISP version, is aimed at developing large-scale expert systems. It executes faster and uses as little as 10% of the memory needed by its LISP version, according to Earl Sacerdoti, vice-president.

S.1 development software for minicomputers and workstations is priced at \$25,000 in a single-user version.

Integrated environments

Carnegie Group, Inc. of Pittsburgh announced it has integrated Knowledge Craft and Language Craft, its AI software development environments, into Version 3.1 of both products.

Knowledge Craft is a productivity tool kit for building large-scale, knowledge-based systems. Language Craft is an environment for building natural language interfaces to operating systems, expert systems, data bases and conventional software applications.

Integrating the two is in-

tended to allow programmers greater access to natural language processing when developing expert systems and to provide users with natural language interfaces, company officials said.

Version 3.1 of Knowledge Craft, \$50,000, and Language Craft Version, \$25,000, are scheduled for release during the third quarter to run on

Texas Instruments, Inc. Explorer, Digital Equipment Corp. VAX and Symbolics, Inc. systems.

Concurrent Common LISP

Intel Corp. of Santa Clara, Calif., and Gold Hill Computers, Inc. of Cambridge, Mass., introduced Concurrent Common LISP (CCLISP) for Intel's IPSC-MX family of con-

current computers. The companies claim this combination is the first commercial large-scale, parallel processing LISP system.

CCLISP also provides debugging tools, a display interface to each node and network services to LISP workstations.

CCLISP provides a Common LISP environment on

each of the multiple microprocessor nodes of the IPSC. Sixteen to 64 nodes, each with 4.5M bytes of memory, can be connected.

Prices for the IPSC with CCLISP are \$175,000 for the 16-node IPSC-MX/D4 system, \$305,000 for the 32-node IPSC-MX/D5 system and \$555,700 for the 64-node IPSC-MX/D6 system.

The only breaks printers are the

Xerox Rebate Check
2080 Telegraph Road, Suite 200
Bloomfield Hills, MI 48303

ACCOUNT NUMBER: 001877
DATE: 04/1/86
CONTROL NUMBER: 11470001
AMOUNT: 681 **500.00 **500.00

PAY TO THE ORDER OF: Malcolm Karlin
8 Tanglewood Road
Stamford, CT 21860

NOT VALID OVER 90 DAYS
AUTHORIZED SIGNATURES: *James Jones*

001877 1:07 200040 5:0 0007:70m3

Rebate for the D80IF

Xerox Rebate Check
2080 Telegraph Road, Suite 200
Bloomfield Hills, MI 48303

ACCOUNT NUMBER: 001879
DATE: 04/1/86
CONTROL NUMBER: 11470001
AMOUNT: 681 **400.00 **400.00

PAY TO THE ORDER OF: Paul Levett
23 Sunset Avenue
Bay Shore, NY 11706

NOT VALID OVER 90 DAYS
AUTHORIZED SIGNATURES: *James Jones*

001879 1:07 200040 5:0 0007:70m3

Rebate for the D80

Xerox Rebate Check
2080 Telegraph Road, Suite 200
Bloomfield Hills, MI 48303

ACCOUNT NUMBER: 001885
DATE: 04/1/86
CONTROL NUMBER: 11470001
AMOUNT: 681 **100.00 **100.00

PAY TO THE ORDER OF: Charles Eaton
18 Allen Street
Richmond, VA 20138

NOT VALID OVER 90 DAYS
AUTHORIZED SIGNATURES: *James Jones*

001885 1:07 200040 5:0 0007:70m3

Rebate for the 635

Xerox Rebate Check
2080 Telegraph Road, Suite 200
Bloomfield Hills, MI 48303

ACCOUNT NUMBER: 001880
DATE: 04/1/86
CONTROL NUMBER: 11470001
AMOUNT: 681 **75.00 **75.00

PAY TO THE ORDER OF: Diana Lynn
2607 Thomas Drive
Los Angeles, CA 16412

NOT VALID OVER 90 DAYS
AUTHORIZED SIGNATURES: *James Jones*

001880 1:07 200040 5:0 0007:70m3

Rebate for the P32CQ1

Xerox Rebate Check
2080 Telegraph Road, Suite 200
Bloomfield Hills, MI 48303

ACCOUNT NUMBER: 001884
DATE: 04/1/86
CONTROL NUMBER: 11470001
AMOUNT: 681 **100.00 **100.00

PAY TO THE ORDER OF: Cameron McNaughton
72 Berger Lane
Rochester, NY 10177

NOT VALID OVER 90 DAYS
AUTHORIZED SIGNATURES: *James Jones*

001884 1:07 200040 5:0 0007:70m3

Rebate for the 630ECS

When you buy a Xerox printer, what you get are breakthroughs. Not breakdowns.

You see, Xerox has been a leader in developing hard-working, reliable printers from the very beginning. We even invented daisywheel printing.

One of our latest printer innovations, however, doesn't stress higher tech, but rather lower prices.

Because from now until July 31 we're offering substantial rebates on our entire line of Xerox Diablo dot matrix and daisy-wheel printers.

So you'll be able to save from \$25 up to \$500, depending on the model you choose.

And choosing is easy since all of these Xerox printers are compatible with a wide range of personal computers, including Xerox, Apple and IBM.

Our Xerox Diablo dot matrix printers let you print in near-letter quality, or high-speed draft quality. And graphics can be merged right in with the text.

CORRECTIONS

A story in the Software and Services section of the April 28 edition of *Computerworld* should have noted that only the Digital Equipment Corp. VMS version of Software AG's Adabas database has been enhanced with the addition of the continuous processing option (CPO). The other version of Adabas, for IBM systems, already features CPO.

**Announcing
Computerworld's
MICRO DIRECT
SHOPPER**

SEE PAGE
125

*Average mean time between failure is 4000 hours.

Xerox, Diablo and the identifying numbers herein are trademarks of the XEROX CORPORATION.
IBM is a trademark of International Business Machines Corporation.
Apple is a trademark of Apple Computers, Inc.

SOFTWARE & SERVICES

Changing the programmer

From page 19

the user interface before the defining the data base, including the data dictionary.

The user interface and data base are two separate but interrelated entities. Data or information items whose constituents are not stored in the data base can-

not be displayed. Conversely, information or data items that should not be displayed should not be stored.

The important thing to consider here is that which ever is designed first — the interface or the data base — will constrain the design of the second. Most fourth-generation languages are oriented toward application data bases rather than the interface, in that they require the data dictionary to be defined before the interface.

The second, and perhaps most important, way to improve user interface design is to improve the system design and requirements phase that occurs before application coding takes place. If a system is approved that requires up to four times more modification than original development effort, the requirements vehicles are not communicating properly.

Most requirements vehicles are paper documents containing a verbal narrative

of how system components will interact and what volumes of data will be stored and processed. These documents also contain a paper representation of what reports and CRT screens will look like.

This form of requirements vehicle does not create a complete description of the resulting system. The following are some hypotheses on why this may be.

A paper representation of a CRT screen does not accu-

rately reflect what the screen will look like, because the real screen will tend to appear more cluttered.

Perhaps most important, prose statements are inherently ambiguous, and it is unlikely that an evaluator/approver and the programmers will interpret a given requirements document in the same way.

An approach that makes more sense is to prototype the interface again and again until the evaluators and potential users are satisfied the resulting system will be both usable and useful. A faithful working model is much less ambiguous than any verbal abstraction.

In an ideal environment, the resulting prototype will be mechanically convertible into the interface of the production system.

Visual screen editor ideal

The ideal prototyping tool will have a visual (what you see is what you get) screen editor. This screen editor should be so easy to learn and use that nonprogrammers can master it with very little instruction.

The only problem with rapid prototyping tools is one of misunderstanding on the part of prospective users and clients. These individuals must be made to understand up front that in a short time they will experience something that will behave and look like the system they will ultimately receive. They must know, however, that the actual system will require several more months for creating and testing the real innards before it is available.

By combining these two proposals for improving programmer productivity, we can generate the requirements for an improved fourth-generation language.

This language would include a prototyping tool that permits a tenfold coding advantage over conventional languages and permit a fully functional prototype to be developed before a data dictionary is defined.

The approach described here will permit us to do more than talk about programmer productivity.

SI adapts tools to VAX

From page 19

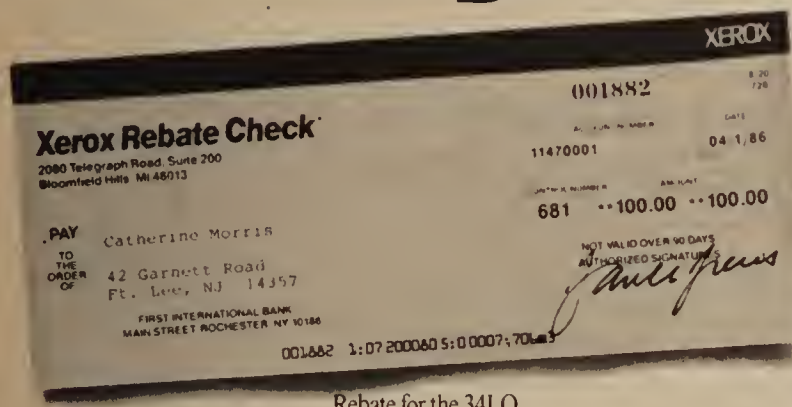
with a single sign-on. It provides multiple levels of security.

VAX Navigation allows users to move from screen to screen within each application without passing through screens they wish to avoid.

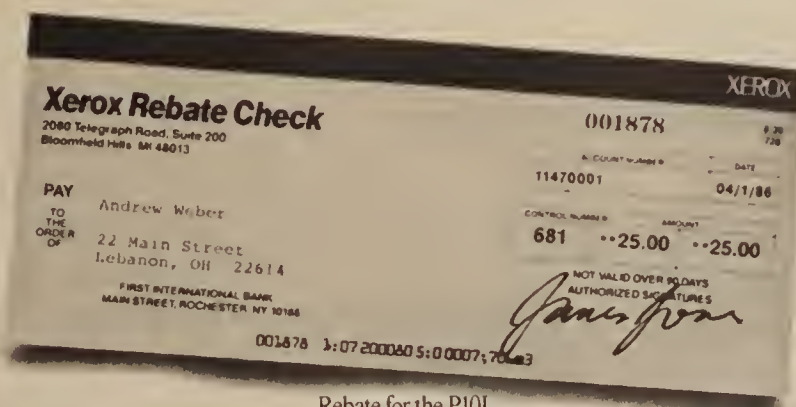
The applications are available immediately, spokesmen said.

XEROX

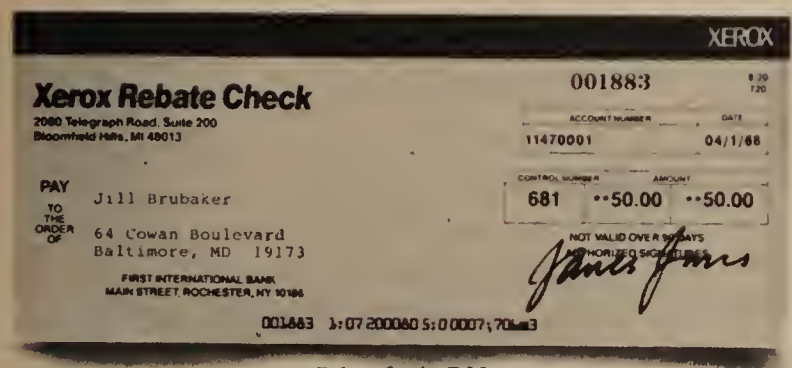
you'll get on Xerox ones you want.



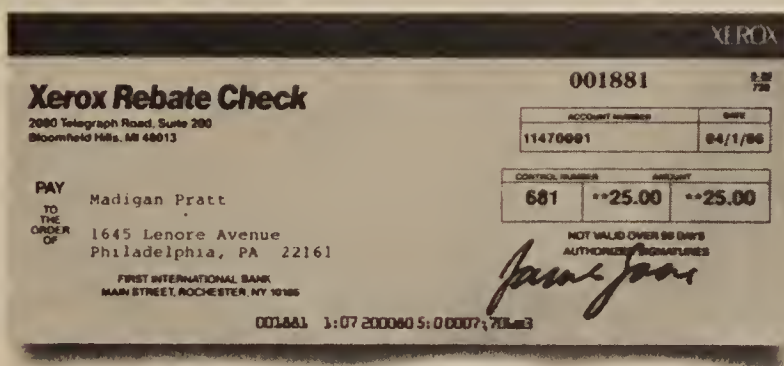
Rebate for the 34LQ



Rebate for the P10I



Rebate for the D25



Rebate for the P12CQI

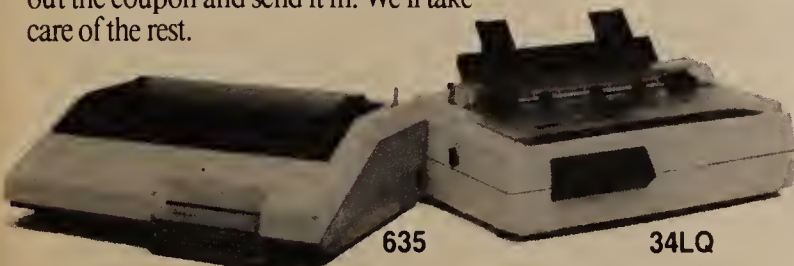
The Xerox Diablo daisywheel printers offer letter quality printing that can easily meet all your word processing needs.

You'll also have your choice of today's most advanced features. Like extended character sets, varied printing styles, and flexible paper handling capabilities.

And every Xerox Diablo printer is backed by a one-year limited warranty on parts and service.

So why not get a big break on the printers that don't break?*

Call your local participating Xerox dealer or sales office for details today. Or call 1-800-TEAM XRX ext. 158A. Or just fill out the coupon and send it in. We'll take care of the rest.



XEROX

Xerox, give me a break.

- ☐ Have a dealer or Xerox Sales Representative contact me.
- ☐ Send me more information on Xerox printers and the Xerox Rebate Program.

Name _____ Title _____

Company _____

Address _____ City _____ State _____

Zip _____ Phone _____

Send to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692

call **1-800-TEAM XRX** ext. 158A
or call 1-800-832-6979 ext. 158A 013/0526

How to Create an Integrated Relational Database Solution.

Start with high performance SQL. Add integrated application development tools. Provide a distributed solution (compatible with IBM, DEC and UNIX). And rely on the industry's finest service and support. Only INGRES can deliver the entire package.

And you can even link your IBM PCs to the database with INGRES/PCLINK. For your users, INGRES provides transparent access to databases on remote computers in your network. While eliminating time-consuming upload and download steps. Multiple, inconsistent copies of data are reduced. And the quality of information used in your company is improved.

1 HIGH PERFORMANCE SQL

INGRES/SQL is broadly compatible with IBM's DB2. Plus INGRES outperforms other Relational DBMS systems. So you'll have an RDBMS that gives your users maximum productivity because the software is faster.

What's more, INGRES/SQL provides you with the high levels of data security, integrity and consistency you demand.

2 INTEGRATED APPLICATION DEVELOPMENT

INGRES is the SQL RDBMS that gives you complete and fully proven integrated application development tools.

You'll have a comprehensive 4th generation application development environment that includes INGRES/APPLICATIONS 4GL; Visual Programming tools for designing forms, queries, reports and graphs; and interfaces to COBOL, FORTRAN, C, PL/1, ADA, PASCAL and BASIC. With each function tightly integrated through INGRES's extended data dictionary.

The result is unprecedented productivity in application development.

3 DISTRIBUTED SOLUTIONS

With INGRES, you can put one database to work even if you have to deal with different hardware. Users can share data and applications across different operating environments. Including the IBM VM/CMS, DEC VAX/VMS and UNIX operating systems (soon, INGRES will be compatible with many other operating systems).

4 EXCEPTIONAL SERVICE AND SUPPORT

To us, even outstanding software is not enough. That's why we've set exceptional standards for service, support and education.

Training is available at Regional Centers or on site. And free, unlimited telephone consulting is there when you need it. With a 24-hour-a-day, 7-day-a-week hotline.

So look into the INGRES advantage. You'll see why customers in over **3,000** installations already enjoy our unique integrated relational database solution. For more information, send in the coupon today. Or call toll-free (800) 4-INGRES.

Relational Technology

1080 Marina Village Parkway, Alameda, CA 94501

JOIN US FOR A FREE INGRES SEMINAR.

Call (800) 4-INGRES for a reservation.

Atlanta, GA	Detroit, MI	Austin, TX
Washington, DC	Denver, CO	Nashville, TN
San Francisco, CA	Philadelphia, PA	Phoenix, AZ
Chicago, IL	Los Angeles, CA	Dallas, TX
St. Louis, MO	Minneapolis, MN	Houston, TX
Montreal, Canada	Seattle, WA	Portland, OR
Boston, MA	San Jose, CA	New York City, NY
Pittsburgh, PA	Ottawa, Canada	Cleveland, OH
Quebec, Canada	Vancouver, Canada	New Orleans, LA
Kansas City, KS	San Diego, CA	Orlando, FL

INGRES. SQL Plus A Whole Lot More.

Yes. Send me more information about INGRES: the integrated relational database solution.

Name _____

Title _____

Organization _____ M/S _____

Street _____

City/State/Zip _____

Phone _____ ext. _____

Send to: Relational Technology, 1080 Marina Village Parkway, Alameda, CA 94501.

© 1986 Relational Technology.

INGRES/SQL, INGRES/PCLINK, INGRES/APPLICATIONS and Visual Programming are registered trademarks of Relational Technology. IBM, VM, DB2, CMS and IBM PC are trademarks of International Business Machines Corporation. DEC, VAX and VMS are trademarks of Digital Equipment Corporation. UNIX is a trademark of AT&T.

MICROCOMPUTERS



SMALL TALK

William Zachmann

Hardware pick: Quietwriter

Although widely (and sometimes uncritically) admired as a company, IBM has a persistent reputation for not really being very innovative. The conventional view is that IBM's marketing and management, not its position at the leading edge of technology, makes the company so successful.

In fact, while IBM's performance is not nearly as flawless as many seem to think, its record in real innovation is much better than is conventionally believed.

Floppy disks, for example, originally were an IBM innovation. Winchester disk drives are called such after the IBM code word for the original "Winchester" disk drive product while it was in development. And the IBM Personal Computer was a much more innovative product than the consensus view would have it.

The IBM Quietwriter Printer Model 2, my personal computer hardware product pick for May, is an outstanding example of IBM innovation in action. The Quietwriter 2 uses a proprietary IBM multilayer resistance ribbon thermal-transfer technology with a 40-pin print head. The result is superb letter-quality text — better than standard letter-quality output — combined with very high-resolution graphics that rival the best that any laser printer can produce.

Until recently, personal computer users had to choose between true letter-quality character-impact printers on the one hand and dot matrix printers on the other. The former, using print wheels or thimbles, are not only very noisy but pathetically slow for graphics. The latter are simply noisy, but even the most costly of the near-letter-

See **HARDWARE** page 32

Zachmann is corporate vice-president for research at International Data Corp. in Framingham, Mass.

Javelin announces range of corporate licensing options

By David Bright

CAMBRIDGE, Mass. — In response to the growing demand for the "selective elimination" of copy protection, Javelin Software Corp. last week announced a corporate licensing and support program for its Javelin business analysis and reporting software.

Pricing begins at \$20,000 for the minimum 50 units, whether protected or unprotected, representing a 43% discount on the \$695 list price. For volumes of 100, 250 and 500 units, the respective discounts are 53%, 56% and 60%. Discounts on larger quantities are negotiable, said Javelin Chairman Robert Firmin.

According to Javelin Marketing Vice-President Dick Bonzagni, corporate users want a mix of copy-protected and unprotected software. "In developing a sales and support program for the corporate market, we first polled many of the largest personal computer user sites," he said. "We learned that most corporations want a combination of both copy-protected and unprotected versions of the software they buy in volume."

In companies with ad hoc software use — such as laboratories, in which each user

may not have his own machine — there is a need to prevent the less experienced users from unknowingly violating a licensing agreement, Bonzagni said. However, more knowledgeable users with their own dedicated personal computers may need to make copies for backup or for working at home, he added.

The first user taking advantage of Javelin's new program is the Management Systems Department of Hughes Aircraft Co. of El Segundo, Calif. "Javelin is the first software vendor to recognize how PC resources are actually managed in a large corporation," claimed B. J. Garnett, manager of the department, in a prepared statement released by Javelin.

Garnett said that instead of losing sales through the site licensing agreements, Javelin should actually profit in the long run. "Ironically, other vendors have been afraid of losing sales from a program like this, when in fact the opposite will more likely be the case. We expect to purchase more copies of Javelin because the multiple-unit licensing program will be so much easier for us to administer."

Firmin agreed that the new arrangement

See **JAVELIN** page 34

Intel pits graphics chip against TI

Micro software vendors supporting both devices

By Douglas Barney

Intel Corp. last week announced its 82786 very large-scale integration graphics coprocessor, a product aimed at speeding graphics applications, that will compete head-on against the 34010 graphics processor from Texas Instruments, Inc. Judging from the reception of microcomputer software vendors, there may be room for both devices.

Both Intel and TI will ship their products in volume in the fourth quarter and expect the devices to speed graphics 10 to 100 times by off-loading graphics functions from the main CPU. This will be especially useful on future machines that use extensive multitasking and windowing, as well as personal computers performing

computer-aided design and engineering.

In addition, both devices support laser printers, giving each a shot at penetrating the desktop publishing market. Unlike the Intel device, the TI 34010 can act as a complete CPU for a laser printer, said Brent Wientjes, TI's 34010 program manager.

Both products will sell for less than \$100 each in quantities of 1,000 or more.

The Intel 82786 coprocessor will be compatible with the IBM Color Graphics Adapter and the ANSI Computer Graphics Interface (CGI) standard. It is supported by Digital Research, Inc.'s GEM and Microsoft Corp.'s Windows operating environments as well as device drivers from Graphics Software Systems, Inc.

In addition, Ashton-Tate and Lotus Development Corp., have announced 82786 support.

Graphics Software Systems, however, has also reached an agreement with TI to

See **INTEL** page 34

INSIDE

Zenographics presentation graphics software reportedly offers 360 million colors on IBM Personal Computers/**30**

Cauzin Systems upgrades its Softstrip Reader with output ability/**30**

NEW THIS WEEK

- Samna Corp. offers Samna Decision Graphics software for the IBM PC
- Tandy introduces new model of IBM Personal Computer AT compatible

■ For more on these and other new products, see pp. 85-107.

INSTANT ANALYSIS

"Every time somebody finds a bug in a new version of MS-DOS, there's all this speculation over whether it's really a bug or some sort of window to the future of the operating system."

— Dave Melin, Microsoft Networks product marketing manager, Microsoft Corp.

Attention dBASE III developers!

INTRODUCING GENIFER. A FULL-FUNCTION APPLICATION GENERATOR THAT CAN SLASH DEVELOPMENT TIME.

If you want to give users the highest quality programs in the shortest amount of time, you need Genifer—a remarkable dBASE III application generator that saves you time and money.

Want to create superb code in minutes, not weeks? Genifer delivers. Interested in creating high-quality prototypes in under an hour? You need this revolutionary product.

Genifer is a trademark of Bytel Corporation.
dBASE III is a trademark of Ashton-Tate.

Here's a special no-risk offer.

Just call the toll-free number below or send us a check for just \$395! We'll rush you the full Genifer package, complete with 190 page manual, sample tutorial data, a tutorial version of Genifer, and the sealed product disk. If you're not completely delighted, return the material (including the sealed product disk) within thirty days of shipping. We will promptly refund your money—no questions asked.

We urge you to act now. Don't miss seeing for yourself how Genifer can provide a total programming solution for you.

Call toll-free:
800-631-2229

In California:
800-541-3366

Locally:
(415) 527-1157

Telex:
176609
bytel

or write:

bytel corporation

1029 Solano Avenue, Berkeley, CA 94706

YES. I'd like to see for myself how Genifer can slash development time and make my life easier. So send it to me for just \$395, subject to your money-back guarantee. My check is enclosed.

Name

Company

Address

City

State

Zip

Title

Phone ()

California residents add sales tax. Price includes UPS shipping to all U.S. cities.

© Copyright 1986 Bytel Corporation

Someday, our children will be able to share information, anywhere, anytime and in any form as easily as we use the phone today. At Northern Telecom, we call this vision the Intelligent Universe,* and we're already building telecommunications products to make it a reality.

Recently, the global telecommunications industry established a set of standards called Integrated Services Digital Network, to help guide the future of telecommunications.

In concert with you our customer, we're fully committed to applying the principles of ISDN. After all, these principles are but another step on the way to our vision.

INTEGRATED—People in different parts of the world have different customs and speak different languages. That's because they were relatively isolated, and their cultures developed independently before the days of radio, television, telephones and fast, easy transportation. Sometimes, it's hard to communicate.

Similarly, computers and other equipment made by different manufacturers often find it hard to communicate, because they were developed independently and in isolation.

At Northern Telecom, we've been designing and building telecommunications products to help change this situation. The features and capabilities we have designed and the design information we make available to others let as many different kinds of products as possible connect and work together so they work better for you. We call a network which offers this kind of open interconnection an OPEN World.*

SERVICES—You don't need to understand what makes a telecommunications network tick to use it. For you, the network is just the communications services you need. And of course, the actual telephone or terminal you use is one means of accessing such services.

At Northern Telecom, we have defined and are building into the network a tremendous capability for the provision of services, and we have introduced a line of products to both access and realize this capability. We call it the Meridian† line of products. It's aimed at enhancing your communications effectiveness by offering you the services you need with the simplicity you demand. Meridian by Northern Telecom.



DIGITAL—Most people find that the best approach to solving a problem is the simplest approach. In telecommunications, the simplest way of carrying information is to convert it to a series of 1's and 0's—a digital bit stream.

A digital bit stream can mean anything—it can be your voice, a letter, a television picture, or the manufacturing diagrams for a new car.

At Northern Telecom, we've been designing and building telecommunications products based on the simple digital bit stream for two decades. We call a network that handles all information in digital form a Digital World.*

NETWORKS—In sports, a winning team starts with a good game plan, and adapts it in real time based on the changing flow of the game.

Up to now, telecommunications networks have followed a very static game plan. They were built mostly of separate elements to handle predictable changes in needs on a long-term basis. There was almost no way of controlling them in real time, so they provided little current information about overloads or breakdowns or anything.

At Northern Telecom, we have developed a new way of designing and controlling telecommunications networks. It's a game plan for public or private network architects who want to design and run their whole network like a winning team. It also lets networks carry different kinds of information more easily and economically and thereby provide the basis for supporting new services and capabilities for you.

We call it Dynamic Network Architecture.*



NETWORKING

MICROCOMPUTERS

Zenographics software rivals graphic power of mainframes

Produces 360 million colors using IBM PCs

By Douglas Barney

ANAHEIM, Calif. — At the National Computer Graphics Association show earlier this month, new versions of Zenographics, Inc.'s Mirage and Autumn presentation graphics programs, said to rival the output of mainframe graphics programs, won the "Graphics Software Shootout."

Both the \$895 Mirage package and the \$595 Autumn package can produce up to 360 million colors using standard IBM microcomputers with

color displays and 64 shades of gray and black on computers without color capability, according to Zenographics.

These products also support most popular brands of graphics output devices, including laser printers, ink-jet printers, thermal ink printers, film recorders, graphics cards and plotters.

In many cases, the graphics output of these devices is enhanced by using Zenographics software. "We extended the color capabilities of output devices," said Michael Behnke, vice-president of marketing.

Mirage is an integrated package that can receive data from either a mainframe or microcomputer and in-

cludes a file manager, graphics editor and charting module.

Autumn is said to be an easier to use package that provides more than 100 predefined chart formats that allow novice users to easily create charts and graphs.

In addition, Zenographics announced two add-on products for Mirage and Autumn. The \$95 Typefaces software provides a family of typographic quality, bit-map fonts that are geared toward lower resolution devices and smaller type sizes, as well as polygonal fonts, which are geared toward larger characters and high-resolution devices. Both Helvetica-like fonts and Times-Roman-like fonts are included. The \$95 Symbols

package provides hundreds of scientific and business images, the firm claimed.

Mirage and Autumn run on IBM Personal Computers and compatibles with at least 320K bytes of random-access memory.

Zenographics also offers the software on larger systems. "It was designed to be portable," Behnke said. "We don't just run on the PC, XT, AT; we also run on VAX, Prime Computer, Inc., IBM CMS, IBM MVS, and we have prototype systems on Univac [Sperry Corp.] and International Computers Ltd."

Prices of the software on larger systems range from \$15,000 to \$30,000.

MADE FOR EACH OTHER.

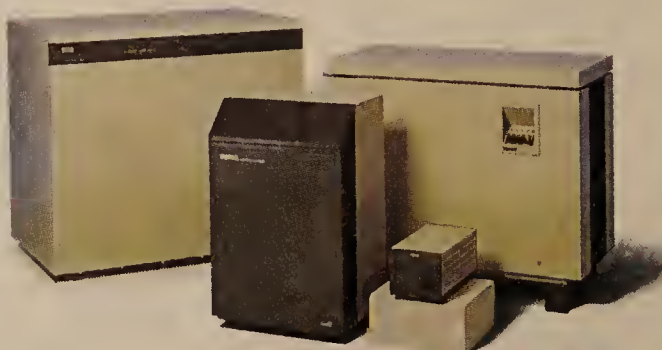


LAUREL & HARDY Characters © 1986 Larry Harmon Pictures Corporation. Licensed by Larry Harmon Pictures Corporation, Los Angeles, California, USA.

Just like Topaz Power Conditioners and your computers.

Noise transients, voltage fluctuations, blackouts—all are problems for computers. But Topaz eliminates these problems with a full range of products: LINE 2® Power Conditioners, ULTRA-ISOLATOR® Noise Suppressors and POWERMAKER® Uninterruptible Power Systems.

Reliable. Affordable. Efficient. Our products are ideal for use with all computers, from micros to mainframes. Call us today at (619) 279-0831. After all, we're made for each other.



TOPAZ®

Excellence in Computer Power

A Subsidiary of the Square D Company

Softstrip lets PCs trade files

By David Bright

WATERBURY, Conn. — With new software from Cauzin Systems, Inc., personal computer users equipped with the vendor's Softstrip Reader can store programs and files as printed strips on plain paper. The strips can then be read by any other personal computer.

Available now, the \$19.95 Stripper software reportedly encodes any file and allows it to be printed on a dot-matrix or nonimpact printer as a 5/8-in. by 9 1/2-in. strip. Connected to a personal computer via an RS-232 port, the \$199.95 Softstrip Reader then can transfer the information to another microcomputer.

When the Softstrip System was introduced last fall, it had reading — but not storage — capabilities.

Key applications for the software include the transfer of word processing files, spreadsheet templates, bank statements and hospital information, said Cauzin Marketing Vice-President Neil Kleinfeld. In addition, over two dozen magazine and book publishers will soon be printing free strip programs in their publications, Kleinfeld claimed.

Kleinfeld stressed that the equipment is not intended to duplicate copyrighted programs or be an alternative to disks. "It will not replace magnetic disks," he said. "It is a complement to disks, rather than a replacement."

For example, if users of the IBM Personal Computer or Apple Computer, Inc. Macintosh need to work with one particular template created with Lotus Development Corp.'s 1-2-3 or Jazz, "you just print up one strip and everyone can use it," Kleinfeld claimed.

Actually, since each strip contains between 900 and 5,500 bytes, depending upon the resolution of the printer, several strips may be necessary. But the software will sequentially number the strips.

According to Kleinfeld, operation of the menu-driven software takes five minutes to learn. The user does not have to specify the computer models being used; when the strips are printed, the software includes information about the originating computer.

The VISUAL language of the future is here !

Have you seen it ?

SYSTEM
IMPLEMENTATION
EXAMPLE

PC2.0

© 1985, ACCUPHASE LTD

"The VISUAL language"

**No other application development tool
can develop business applications faster !**

SATISFACTION GUARANTEED or YOUR MONEY BACK !

If you cannot save \$995 in development cost on your first application, return the package for a full refund.

Order now, and pay only an introductory price of \$695 (plus tax where applicable), 30% off the \$995 list price.

CALL: (800) 8-SIMPLE
(800) 826-3069 (CA)

**SOFTWARE MERCHANTS
UNLIMITED**

3767 OVERLAND AVE., SUITE 112
LOS ANGELES, CALIFORNIA 90034

dealer inquiries welcome IBM is a trademark of International Business Machines

The First Picture-Oriented Applications Generator and Prototyping Tool

For the IBM PC and compatibles

Complete

Contains all you need to instantly develop applications.

- Relational data base management
- Query-by-example
- Screen format generator
- Report generator
- Menu generator
- Help/Documentation generator
- Database Mail-merge capability
- Built-in expert analyst/programmer

Powerful

Non-procedural. Unique specification/design language used to create complex integrated business/accounting systems.

- develop data-intensive applications with ease
- use multiple data files as easily as using one file in all your programs
- create standard programs automatically
- painlessly "paint" custom menus to drive your applications
- perform data "batch updating" and print reports simultaneously
- enter multiple records into multiple files via a single form
- incorporate advanced features such as pop-up search windows, data-entry/edit program interrupts, custom help and documentation

Fast

Written in assembly language - responds quickly.

- design programs as fast as a user can specify requirements;
- instantly create executable code from specifications

Increases productivity

Simply "specify" and "design" what you want done.

- pattern-recognition logic eliminates tedious line-by-line programming
- picture-oriented specification language minimizes writing and debugging effort

Easy to use

More than user-friendly. Its visual and picture-oriented medium makes it truly user-seductive.

- built-in interactive tutorial and context-sensitive help guide you in developing applications
- well-designed menu allows you to perform otherwise complex tasks with one or two keystrokes
- immediate feedback and visual approach makes "programming" easier than the abstract, word-oriented procedural method

I WANT TO DEVELOP COMPLETE APPLICATIONS FASTER !

- ☐ Please send me the full SIMPLE package (\$695).
☐ Please send me a SIMPLE demo disk (\$9.95)
☐ Please send me more information

Enclosed is my check or money order for \$ _____ (CA residents, add sales tax).

Name/Title _____

Company _____

Street _____

City _____

State _____

Zip _____

Phone() _____

Cut and mail to:

**SOFTWARE MERCHANTS
UNLIMITED**

3767 OVERLAND AVE., SUITE 112
LOS ANGELES, CALIFORNIA 90034

Pls. check one:

- ☐ END-USER
☐ DEALER
☐ VAR

MICROCOMPUTERS

AT&T, Samna offer OA tools

MORRISTOWN, N.J. — A joint development effort between AT&T Information Systems and Atlanta-based Samna Corp. has produced two office automation packages for the AT&T Personal Computer 6300 and other IBM-compatible microcomputers. Both packages will be marketed by AT&T.

According to AT&T, the Write Power 1 package offers standard word processing features plus DIF, ASCII and IBM Document Content Architecture translation; a pop-up message window to record telephone messages; mail merge; and forms creation and mapping capabilities. The package can also use the new AT&T Model 7500S Electronic Typewriter

as an I/O device, the company said. Write Power 1, currently available, is priced at \$495.

AT&T's Write Power 2 incorporates Write Power 1's features along with an integrated spreadsheet and the Wordbase Manager, which reportedly searches through all files on a disk to locate any word or group of words and reports the file that contains them. The software also provides automatic table of contents and index generation. Write Power 2 will be available in July for \$745.

Both packages feature hot-key connectivity to Digital Communications Associate's Irma card and compatibility with AT&T's Starlan local-area network, AT&T said.

Hardware pick: IBM Quietwriter

From page 27

quality dot matrix printers still produce rather distinctive dot matrix-style output.

Within the past few years, laser printers have begun to offer an attractive alternative. But these are not only expensive, they are relatively complex devices as well. "Relatively complex" translates, unfortunately, into relatively prone to failure and extremely difficult (if not downright impossible) to repair when broken.

The IBM Quietwriter 2 offers the simplicity and reliability of a dot matrix printer, the text and graphics

quality of the best of the laser printers, extremely quiet operation and reasonably high speed, all at a price (\$1,595) comparable to that of a good printwheel or thimble-impact printer.

For my money, it may be the best choice for an all-around personal computer printer these days.

The Quietwriter 2 printing technology is the same as that used in IBM's high-end Quietwriter 7 typewriter. Like the earlier Quietwriter Printer Model 1 (which lacks graphics capability), it works with the same ribbons, type font cartridges and user-replaceable print heads as the typewriter. This should ensure ready availability of supplies.

In character mode, the Quietwriter 2 operates in the range of 40 to 60 char./sec. Although relatively slow compared with high-performance dot matrix printers, this is fast enough for most users and much faster than most character-impact printers.

In the all-points-addressable graphics mode, the Quietwriter 2 is not exactly a speed demon. However, it is much faster than a printwheel printer in comparable applications. While volume production applications would require a faster (and much more expensive) device, I find the Quietwriter 2 quite adequate for personal use for graphics output.

The Quietwriter 2 high-resolution graphics mode offers a choice of 60 by 60, 120 by 120 or 240 by 240 dot/in. Another mode offers compatibility with the IBM Graphics Printer and Proprinter at 72 by 60, 72 by 120 or 72 by 240 dot/in. In the higher resolutions, the Quietwriter 2 offers graphics quality that exceeds that of most laser printers.

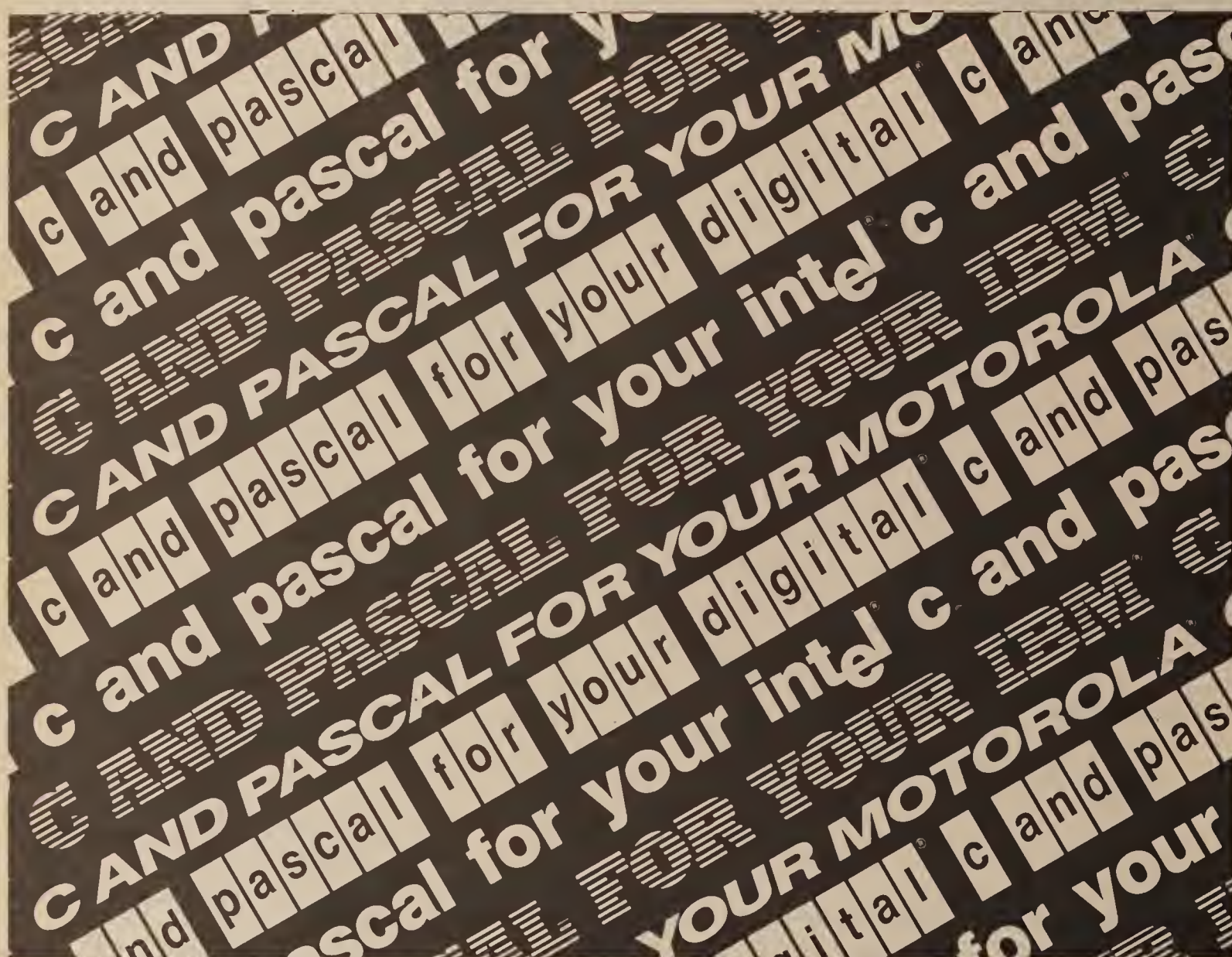
Caution about software compatibility

But a note of caution is in order about compatibility with current software. Despite the compatible features it shares with the IBM Graphics Printer and Proprinter, the Quietwriter 2 does not typically work directly with software drivers written for those devices.

At a minimum, printer control codes must be sent to the printer to put it into compatibility mode. This can be done with software that includes provisions for sending printer setup strings. However, much popular personal computer software not only lacks such provisions but does not even allow for user-provided device drivers. As a result, the Quietwriter 2 cannot be used with many software packages until the software vendor provides a driver.

This is really only a short-term problem, since software vendors will certainly provide drivers for the IBM Quietwriter in the near future, if they have not already. However, it can certainly be a short-term annoyance for a user who expects (as the IBM product literature implies) that the Quietwriter 2 can be directly substituted for an IBM Graphics Printer without modifications to existing software.

Overall, the Quietwriter 2 is an excellent device offering what will strike many as the best compromise between price and features for a general-purpose personal computer printer. Available options include a sheet feeder as well as a continuous form feeder and a large selection of character type font cartridges. The device prints on transparencies as well as on plain paper stock.



Whitesmiths, Ltd. Has The Compiler You Want On The Machine You Use.

For over seven years Whitesmiths, Ltd. has focused its efforts solely on developing and supporting a family of quality systems software. Today, Whitesmiths is the only company offering compatible C and Pascal native and cross compilers for the full spectrum of computers on the market—from the IBM PC to the IBM 370, from the DEC Micro-11 to the VAX 8600, and all of the most popular processors in between.

As a forerunner in the development of C and Pascal compilers, Whitesmiths has played a major role in defining and refining the standards for ANSI C and /usr/group libraries.



Whitesmiths, Ltd.

97 Lowell Road, Concord, MA 01742 • (617) 369-8499 / Telex 750246

The result is a product line built from the ground up to provide a uniform environment for the professional applications developer. Identical source code across all machine architectures; support for ROM-based programs; a uniform run-time environment; and the ability to mix code in assembler and other high level languages are just a few of the many features that comprise these superior compilers.

If you need a C or Pascal compiler for your machine, give Whitesmiths a call at 1-800-225-1030.

Chances are, we have what you want.

INTERNATIONAL DISTRIBUTORS **FRANCE** COSMIC S.A.R.L., 52 Quai des Carrières, 94220 Charenton Le Pont, Paris, (14) 378-8357 • **GERMANY** GEI, Gesellschaft fuer Elektronische Informationsverarbeitung MBH, Pascalstrasse 14, D-5100 Aachen, 02408/13-0 • **JAPAN** Advanced Data Controls Corp., Nihon Seimei Otsuka Bldg., #13-4, Kita Otsuka 1-Chome, Toshima-ku, Tokyo 170, (03) 576-5351 • **SWEDEN** Unisoft AB, Fiskhamngatan 10, S-14155 Goteborg, (31) 125810 • **UNITED KINGDOM** Real Time Systems Ltd., P.O. Box 70, Douglas, Isle of Man, (624) 26021

WHAT IF YOUR PRESENT SOFTWARE COULD RUN ON ANY COMPUTER, REGARDLESS OF MAKE?

Report on Conformability

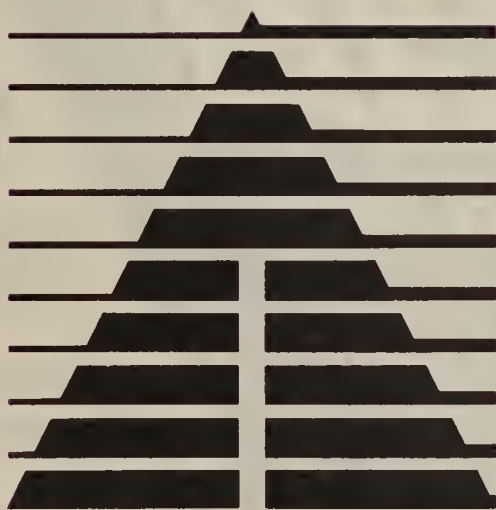


With the Austec Conformable Environment™, thousands of existing Cobol applications can run unaltered on any computer, regardless of system architecture.

Which means that from now on, you can make purchasing decisions on the basis of capability, not compatibility.

Networks of disparate computers running disparate operating systems can now distribute processing power, data, and applications on an ad hoc basis.

Independent confirmation of this remarkable



AUSTEC
CONFORMABLE
ENVIRONMENT™

advance in computer technology is provided by International Data Corporation. For a free copy of their report on Conformability, call 1-800-556-1234 Ext. 508. In California 1-800-441-2345 Ext. 508.

ACEBRIDGE™, ACECOBOL™, and the other products that make up the Austec Conformable Environment are only available from your computer manufacturer. They've been licensed by IBM, AT&T, Digital Equipment Corporation, NCR, Honeywell, Olivetti and other major vendors.

If your computer company doesn't yet conform, it's time to get more demanding.

**DEMAND CONFORMITY
FROM YOUR
COMPUTER COMPANY.**

Austec Inc., 2099 Gateway Place, Suite 400, San Jose, CA 95110, USA

Austec Limited, First Floor Heathcoat House, 20 Savile Row, London W1X 1AE, England

Austec International Limited, Ground Floor, 344 St. Kilda Road, Melbourne, Victoria 3004, Australia

The Austec Conformable Environment, ACEBRIDGE and ACECOBOL are trademarks of Austec, Inc.

MICROCOMPUTERS

DBMS reads Dbase directly

By Douglas Barney

BURLINGTON, Mass. — Alpha Software Corp. this month released Alpha/Three, a \$395 menu-driven data base manager that uses the same file format as Ashton-Tate's Dbase III, currently the leading microcomputer data base product in large corporations.

Alpha/Three can read and write to Dbase disks directly, avoiding the format conversion process that tends to create redundant and inconsistent data files. "File conversion is a pain in the neck," Alpha President Richard Rabins said.

Alpha expects its new data base to complement Dbase within corporations. "Data bases fall into two classes, menu driven and command driven. We are sure that we are the first to come out with a powerful menu-driven product that uses the Dbase files natively," Rabins claimed. "A company that has standardized on

Dbase in the high end is given a compelling reason to choose Alpha/Three for their menu-driven product."

Alpha believes the product can stand on its own merits as a stand-alone package. According to Rabins, Alpha/Three has sophisticated report writing, form generation and mailing list capabilities.

"You can do very sophisticated reports without programming. It is a very visual, free-form report writer," Rabins noted.

Alpha/Three also offers a built-in form letter generator and basic word processing capability. "We have built logic into the form letter; you can make the text vary depending upon the status of one of the fields," Rabins said.

Alpha/Three runs on IBM and compatible personal computers with at least 320K bytes of random-access memory. A hard disk drive is recommended.

True Basic Programming Libraries get six 'volumes' for IBM PC use

HANOVER, N.H. — True Basic, Inc. this month announced six additions to its True Basic Programming Libraries, a set of tool and utility companion products for the True Basic language on the IBM Personal Computer.

The additions, each priced at \$49.95, include The Developer's Toolkit, Communications Support, Forms Management Library, Btrieve Interface, Sorting and Searching and Advanced String Library.

According to the company, The Developer's Toolkit provides routines for creating, reading and removing subdirectories; hiding and unhiding files; switching between displays; loading registers and triggering interrupts.

Communications Support reportedly allows simultaneous use of two communications ports at up to 19.2K

bit/sec., along with interrupt-driven operation with fully buffered input and output.

Forms Manager Library is said to offer a group of easily modified forms and input checking routines.

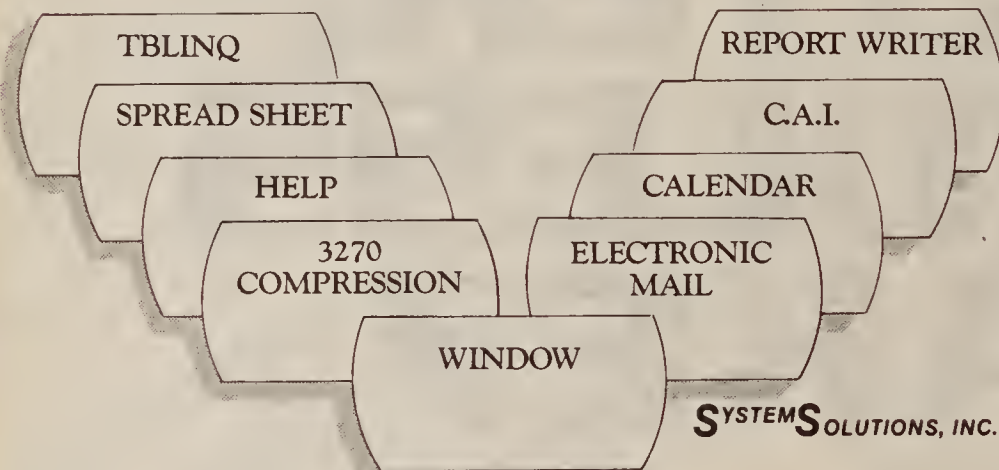
According to the company, Btrieve Interface allows programmers to access Softcraft, Inc.'s Btrieve file management package, permitting the management of data bases with up to 4M bytes per record and 24 key fields per file.

Sorting and Searching gives 14 subroutines for both string and numeric sorting, including quick sorts, heap sorts and multikey sorts, the company said.

Advanced String Library offers pattern matching, expression scanning, parsing, text manipulation and a 38,000-word English dictionary, according to True Basic.

WE DO IT WITH MIRRORS

CICS 2010



OVER 25 USEFUL PROGRAMS
ARE AVAILABLE... ALL FOR ONE
LOW PRICE.

For more information please call
1-800-523-9654, or
In Florida, call 1-800-331-0459

Intel pits graphics chip against TI

From page 27

make the 34010 compatible with the CGI graphics standard. TI also has been negotiating with Microsoft and is completing a port to make Windows compatible with the 34010.

The success of both devices is likely to be tied to that of environments such as Microsoft Windows. "If Windows is hot, this also has to be into the same category," said Ron Goldfarb, manager of office automation for Pratt & Whitney Administration, of East Hartford, Conn. "If we jump through the window with both feet it will be a helluva product."

"TI is probably our biggest competitor right now," admitted Mark Olson, product marketing manager in

Intel's graphics component operation. Intel's device is essentially self-contained, and nonprogrammable. The TI device has fewer built-in instructions. "The TI product does have a certain amount of flexibility, but it is still software that executes the drawing instruction set, and ours is tuned hardware that executes it much faster," Olson claimed.

But TI argued for the programmability of its chip. "As algorithms evolve or user interfaces evolve or standards evolve, you can migrate with the product," Wientjes said.

The Intel device will work with all Intel microprocessors, Digital Equipment Corp.'s Microvax, Zilog Z80-based machines and Motorola, Inc. 68000-based machines. TI's 34010 also will work in many architectures. "We are independent of the host processor. We work equally well with a Motorola 68000-based bus or an Intel 8086-based bus," Wientjes said.

Javelin offers licensing options

From page 27

ment would give Javelin "much more leverage per sales call," adding that his company would make a good return on a minimum license for 50 units.

At press time, Hughes Aircraft was the only licensee, but Firmin said Javelin was in the process of closing several other deals, most covering 100 or 250 units.

In addition to discounts, the new arrangement gives corporations uniformity of software releases, Firmin pointed out.

The unprotected version of Javelin can be copied using standard IBM PC-DOS commands. Under the corporate purchasing agreement, the software customer must record specific users of unprotected Javelin along with the software's particular copy number. Furthermore, individual users must also agree in writing not to make copies for others to use, according to the Javelin purchasing agreement.

FINANCIAL SOFTWARE

Our Financial Software is designed to maximize the hardware potential of your **IBM System/38 or System/36**. It is a fully integrated system that provides immediate access to all the information you need with complete documentation, training and support.

307 EAST SHORE ROAD, GREAT NECK, NY 11023

516-466-5210

Imrex
Computer Systems, Inc.

• General Ledger

• Accounts Receivable

• Accounts Payable

• Purchase Order

• Fixed Assets (S/36)

MANTIS[®] 1981

"Cincom application tool slashes development time."

Source: Computerworld, January 19, 1981

MANTIS 1982

"MANTIS has paid for itself many times over in programmer productivity and end-user satisfaction."

Source: Jay Lazarre, V.P. for MIS, Pellerin Milnor

MANTIS 1983

"Performs like COBOL, with the productivity of a true 4GL — and used for all new, on-line development."

Source: Tony Liberoni, Manager of Operations and Systems, PPG Industries Chemical Group

MANTIS 1984

"100 % of our new on-line development is in MANTIS."

Source: Luther Perry, D.P. Director, Santa Cruz County, CA

MANTIS 1985

"MANTIS is the international on-line application development standard for General Foods."

Source: Fred Lambrou, International Director of Information Services, General Foods International

MANTIS 1986

The Best Just Got Better.

Proven in over 2,000 user sites, MANTIS, from Cincom[®], is the premiere fourth generation application development system.

And, now the best is even better. Our major new release of MANTIS gives you even greater performance and productivity.

With MANTIS, you can prototype, refine, test, and release an application for production in a single, interactive session. Compile-free MANTIS applications are fast, and easy to develop and maintain. And MANTIS provides such high performance that many users make it their standard for all on-line applications.

MANTIS portability lets you move applications — **without change** — from one operating environment to another. From VSE to MVS. From CICS to IMS/DC. Even from one hardware system to another, including IBM[®], DEC[™] VAX[™], Wang VS[®], NCR[®] VRX and others. And MANTIS provides support for multiple data structures, such as VSAM, DL/1, SQL/DS, SUPRA[™] and others.

To see just how much better MANTIS really is, **compare it to any other system** you're using or evaluating. For a demonstration or more information, call the toll-free number below. In Ohio, call 513-661-6000. In Canada, 416-279-4220.

1-800-543-3010.



World Headquarters • 2300 Montana Avenue • Cincinnati, Ohio 45211

IBM is a registered trademark of the International Business Machines Corporation.

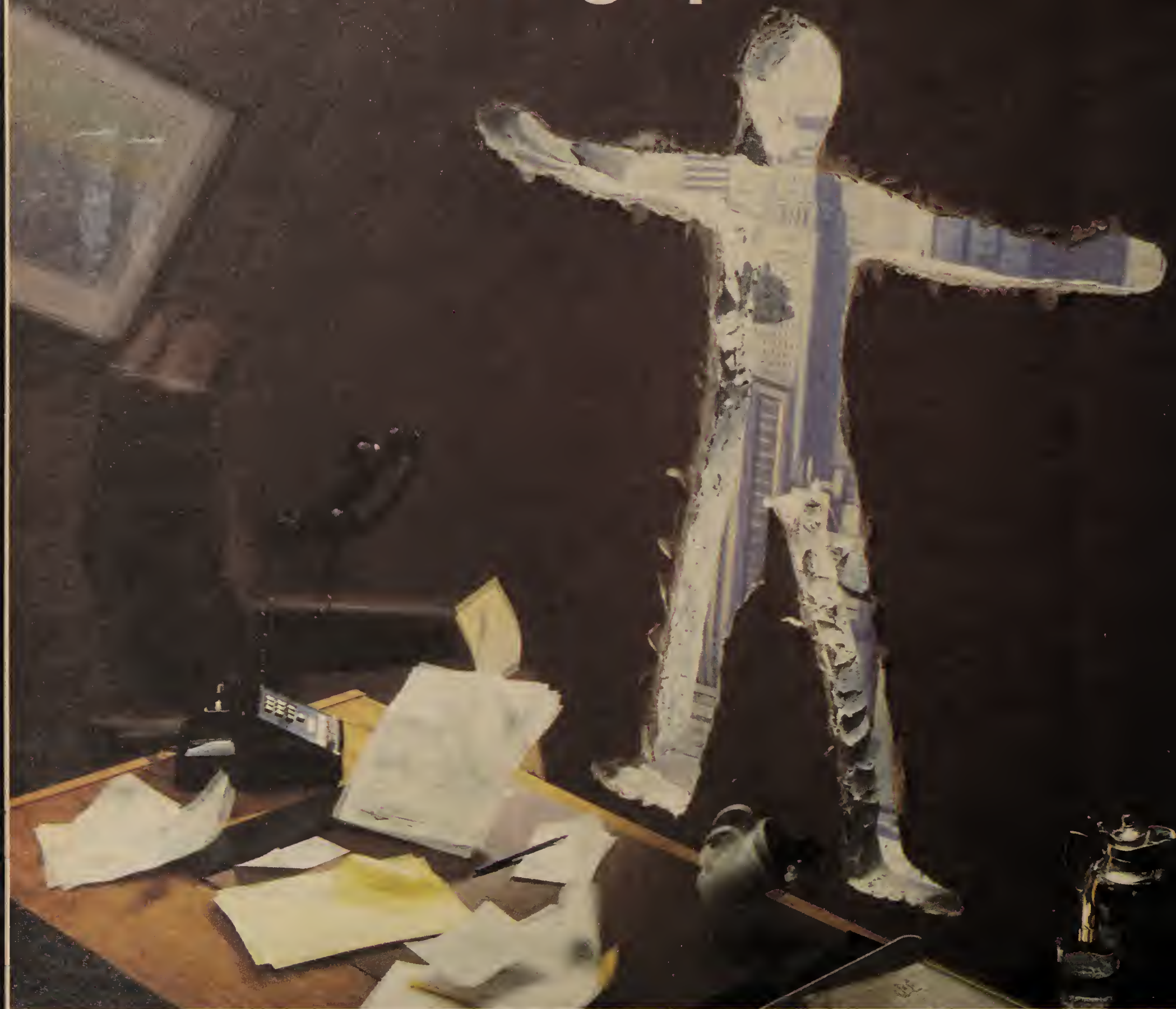
DEC and VAX are trademarks of Digital Equipment Corporation.

Now Available
For IMS/DC Users.

Wang VS is a registered trademark of Wang Laboratories, Inc.

NCR is a registered trademark of NCR Corporation.

Rumor has it you're moving up to T1.



Come back.

T1 speed.

It doesn't have to be as scary a project as everyone thinks. Fact is, installing T1 can be a fairly simple chore.

We're Infotron.

We design, build, and install communications networks. Reliable.

Compatible. Sophisticated T1 networks that support data and compressed digital voice.

Our newest system, InfoStream™, introduces an open architecture to T1 networking based on Infotron's long-established strengths in multiplexing

and switching.

We'll take care of you every step of the way. Before. During. And after the sale.

Calm down. Dust yourself off. Then call: 800-345-4636.



See us at ICA, Booth #322. And at NCC, Booth #A1220.

 **INFOTRON** SYSTEMS

COMMUNICATIONS



DATA STREAM
Elisabeth Horwitt

Having a say in standards

This is the year that standards bodies will be making decisions about the way companies will link their computers for the next decade or so. The Corporation for Open Systems (COS), the MAP/TOP Users' Group and the rest have encouraged participation from the user community. Why, then, are the small- to medium-size companies not exercising their right to take part in the process?

I noticed it at the recent MAP/TOP Users' Group meeting in Seattle: non-Fortune 500 user companies were scarce to nonexistent. The corporate communications and DP managers I encountered at the sessions all seemed to come from the same select group of Fortune 500 aerospace and automobile manufacturers. Smaller businesses — and I don't mean 12-person firms but sizable companies with multimillion-dollar revenues — seemed to have kept their people home.

Of course there were exceptions. I spoke to William Shurtleff of Sandia National Laboratories, an Albuquerque, N.M., company that develops nuclear weapons. He said his company sent him to the conference because "we have a bunch of computers we want to link, and MAP is the only game in town; it isn't a network just for the factory, it just started there."

I also ran into a Michigan Bell representative who said his company wants to figure out how to interface its transmission services with the growing number of corporate MAP networks in the Detroit area. And of course, there

See **HAVING** page 40

Horwitt is Computerworld's senior editor, communications.

Intellihub gets trial run

Network service said to get users on road to ISDN

By Stanley Gibson
and Elisabeth Horwitt

Intellihub, the latest in a series of dedicated, digital network services introduced by New York Telephone Co., will take users "another step on the road to ISDN," a company spokesman claimed. The service will be provided to Manhattan, N.Y., brokerage house L. F. Rothschild, Unterberg Towbin for a 12-month trial period if a contract currently under discussion goes through, according to New York Telephone. Based on the Northern Telecom, Inc. DMS-100 digital central office switch and Dynamic Network Controller, the service will become a tariff offering sometime in the first quarter of 1987, the operating company said.

According to a Rothschild telecommunications staff member, the Intellihub system will both save the company money and make its current system easier to use by eliminating tie lines and some 16 WATS lines. As the only so-called "first applica-

tion" customer, Rothschild will not pay for Intellihub services, he noted. While the initial offering will only support voice communications, data transmission will be added in the third quarter of this year, according to New York Telephone.

Intellihub is based on four Pathways digital customer-to-central office transmission services introduced by New York Telephone in the spring of 1985. These include the Superpath 1.5M bit/sec. Service; Flexpath Digital PBX Service, which provides a 24-channel, T1 link between a customer's digital private branch exchange and central office facilities; Infopath Packet Switching Service; and Switchway 56K bit/sec. Service, which offers 56K bit/sec. transmission over ordinary, circuit-switched lines.

According to Intellihub Project Manager Sergio Cruz, the Pathway services offer customers "an easy migration path to ISDN." The service offerings will run on dedicated private lines between customer- and central-office facilities until the operating company's all-digital network is complete. "Then everyone can use virtual private circuits instead of dedicated

See **INTELLIHUB** page 44

NCR Comten aims to outgun IBM's SNA, adds VLSI, cache memory to 5660 line

By Elisabeth Horwitt

Continuing to challenge IBM in the mainframe communications processor market, NCR Comten, Inc. last week introduced Comten 5660, a line of communications processors that reportedly are three times faster and offer more line connectivity than any other Systems Network Architecture (SNA)-compatible communications processor on the market.

"We believe that the 5660 represents a new generation of communications processors," said David Anderson, NCR Comten marketing strategy and planning manager.

Added logic features such as very large-scale integration (VLSI) and cache memory give the 5660 approximately three times the processing power of the IBM 3725 communications processor, he added. This en-

ables the system to support up to eight mainframes and 1,024 full-duplex communications lines, compared with a 256-line upper limit for the IBM 3725, according to Anderson. The 5660 can also support 1.54M bit/sec. T1 lines while performing other tasks concurrently, an NCR Comten spokesman said.

"Having that much power and connectivity in a box means you can get by with fewer communications processors with a big network," Anderson said. "That means you save on manpower and software, since every time you add another processor you have to do another system generation."

The 5660 features up to 16M bytes of main memory, compared with 4M bytes for the older Comten 3690 communications

See **NCR** page 40

NEW THIS WEEK

- Honeywell offers an electronic six-wire key telephone system

- For more on this and other new products, see pp. 85-107.

INSTANT ANALYSIS

"Our strategy is to encourage other network vendors to interface with our network management system, to give end-to-end management capabilities to our customers, whose complex networks, we realize, often contain non-IBM equipment."

— William Warner, manager, network management products, IBM

Texas department puts cart before horse in choosing network

Selects micro software tools before hardware

By James A. Martin

AUSTIN, Texas — "Our decision to pick the software before the hardware for our new networking system was like putting the cart before the horse," said Terry Parmley, administrator of the applications support division of the Texas Department of Human Services (DHS).

DHS hopes by early 1987 to bring on-line a data network linking some 3,000 IBM Personal Computer ATs, which have yet to be installed at the 90-odd DHS branch offices throughout Texas. PC ATs within each office will share files and send messages

over a local-area network. A communications processor installed on each network will act as a gateway to a remote link to Sperry Corp. 1184 and 1191 mainframes located at DHS' Austin headquarters.

While some companies would consider the personal computer network to be the key element in this system, DHS' first priority was to find the right fourth-generation language to facilitate caseworkers in accessing and maintaining the information they need to deal more effectively with clients.

"We decided three years ago to put automation in for caseworkers in dealing with clients," said L. D. England, deputy commissioner for information systems. "This would help us achieve productivity with heavy

work loads and give caseworkers the opportunity to determine benefit eligibility while the client is there."

An agency with a \$2.4 billion budget, DHS wants to enable caseworkers at its branch offices to maintain client files locally and also access the mainframe files in Austin. "The mainframe holds the rules and regulations governing benefit eligibility requirements, which are constantly changing," Parmley said.

Under the current system, client information used to determine eligibility for state welfare programs is taken down by the caseworker, then sent on as hard copy to data entry operators, who enter it into the Sperry mainframes on some 200 Sperry UTS400 terminals. The client sometimes waits two weeks to find out if

he is eligible, Parmley said.

The new system will enable caseworkers to bypass the paperwork and the data entry operators and directly input the data on PC ATs. Caseworkers will also be able to "determine eligibility on the spot" by obtaining pertinent data on the mainframe in real time, Parmley said.

Caseworkers will maintain their client files from the last two years in file servers at each branch office. "Things that have been sitting in file drawers will gradually be keyed into the system. We should have 35G bytes of on-line client information by 1990," Parmley noted.

DHS projects it will save \$130 million in expenses during the next five years by eliminating the clerical

See **TEXAS** page 40



AT&T 724 Multiplexer

*AT&T DATAPHONE II
System Controller*



*AT&T PC 6300
AT&T Model 4000
Modem*



AT&T Multifunction Communication System
© 1986 AT&T Information Systems



*AT&T 455
Printer*

How AT&T's unrivaled strength in communications helps you build a better information network.

AT&T's approach to network management and control reflects a century of communications experience. And a century of leadership.

Here's what it means to you.

Performance you can rely on. AT&T is the only company that offers you complete management of digital, analog and private line networks with *one* system—the evolving DATAPHONE® II system product line.

It's a full line of modems, Data Service Units and multiplexers that combine network managing and diagnostic capabilities to deliver maximum uptime from an integrated *system*.

The mainframe connection. When you're in the 3270 environment, the AT&T 6500 Multifunction Communication System makes a lot of sense. Full compatibility, access to multiple synchronous or asynchronous hosts, plus powerful multitasking, put maximum mainframe muscle on the desktop.

AT&T 3B Computers working with our BSC/SNA connectivity software give you departmental processing of mainframe data.

We make the pieces fit. Flexibility and adaptability set AT&T networks apart in both local and departmental use. Systems like the AT&T STARLAN NETWORK and 3B NET give you the network best suited to corporate requirements with no sacrifice in control of your computer resources.

And with our Information Systems Network (ISN), you can even link your current systems and networks to equipment from other manufacturers.

Computers made to communicate.

Both the AT&T PC 6300 line and the AT&T UNIX™ PC merge computing with communications. Optional or built-in modems and communications management software make simultaneous voice and data exchanges as simple as a few keystrokes.

And thanks to UNIX System V, the entire AT&T 3B Computer family offers integrated and flexible communications for departmental computing solutions.

A compatible family. AT&T UNIX System V-based computers are compatible within the line. And beyond that, AT&T offers computers, terminals and printers that are operationally compatible with accepted market standards.

The results are easy integration as well as protection for your existing hardware and software investments.

The computers with the future built in. As your needs change and technology advances, AT&T network management products will provide accommodation without obsolescence.

To learn more, call your AT&T Information Systems Account Executive, your authorized AT&T supplier or simply dial 1 800 247-1212.

Because when you invest in information, we think you deserve a continuing return.



AT&T

The right choice.

COMMUNICATIONS

Having a say in standards

From page 37

was a sizable contingent of consultants and vendor representatives.

But the majority of corporations represented at the MAP/TOP Users' Group were the manufacturing and financial giants on the leading edge of networking technology. The same applies to COS, now that it is open to user organizations. And, while I have seen no membership roster for the American National Standards Institute, I would bet the users that sit on its working committees have similar affiliations.

According to Richard Miller, president of Palo Alto, Calif., consulting

company Telematics International, participation in the direction of evolving standards is "too expensive a franchise for low-end users. They just can't afford to send their own representatives to these meetings on a regular basis."

The question is whether they can afford not to. More and more MIS and DP directors are saying that data communications is a top priority at their companies.

At the same time, the emphasis has moved from isolated local-area networks linking a department's or branch office's IBM Personal Computers to "enterprise networks" that link the resources and users of an entire corporation, then extend to suppliers, distributors and customers. This makes networking standards a key issue, because the wider a company casts its networking net,

the more diverse the range of systems with which it needs to communicate.

Any company that plans to make data communications part of its competitive strategy can benefit from participating in, or at least hearing about, the standards bodies' latest activities. But the price is high.

Who but someone like General Motors Corp. or McDonnell Douglas Corp. can spare MIS executives to sit monthly on a committee that is hammering out specifications for sending commands to robots? What small company can afford to fly its managers cross-country to a users' conference, where they do nothing productive except listen for three days?

Miller suggests that smaller companies can get around the financial problem by pooling their resources. He suggests they form a consortium

of businesses from the same geographic region with similar networking priorities and send a representative to the standards group meetings that seem most relevant.

This sounds like a fine idea to me. The consortium could jointly hire a consultant whose sole job would be to participate in the standards development process.

Regular attendance is a must if your envoy is to keep abreast of new issues and not be swamped by the rapidly proliferating jargon that technical committees love to use. I hesitate to accuse one TOP working committee of being deliberately esoteric. But was it really necessary — particularly during a presentation that was purportedly for the edification of the MAP/TOP user community at large — to refer to 5M bit/sec. baseband cable as "5base36"?

What's Good for Your Mainframe is Essential for Your PCs

Now, you can take care of PC backup and security needs as effectively as for your mainframe.

PC Underware™ from USS includes backup and security software products for IBM PC, XT, AT, and 100% compatibles. PC Underware provides integrated solutions for your most pressing PC problems.

And, with a USS Unlimited Use License Plan, you can solve those problems for all your PCs for a low, one-time fee.

Let us show you our PC Underware. Call **TOLL-FREE** today for a free 30-day evaluation of any of

these fine PC Underware products:

- **TakeTwo™**—automatic hard disk backup.
- **OnGuard™**—hard disk access control security.
- **PrivacyPlus™**—data-encryption for hard or floppy disks and LANs, with optional security control and administration.

Providing backup and security for your PCs isn't just a good idea . . . it's a necessity. Call now.

800-892-0007.

In VA call (703) 556-0007.



United Software Security, Inc.
8133 Leesburg Pike
Vienna, VA 22180

NCR Comten to outgun IBM SNA

From page 37

processor, Anderson said. This enables the 5660 to support value-added capabilities, such as mixing SNA and non-SNA switching on the same trunks, he added. "Plus, NCR Comten will be expanding our network management control capabilities in the future, and we need that memory space."

The product incorporates a service subsystem with built-in self-testing and remote diagnostic capabilities, according to NCR Comten.

A Comten 5660 system supporting eight mainframes and 780 communications lines costs \$1,230,000 plus \$4,570 monthly for maintenance. The product will be available in the fourth quarter of 1986.

Texas DHS puts cart before horse

From page 37

work of storing and accessing hard-copy files at branch offices and by helping workers to estimate benefits more accurately. "We have been awarding benefits that people are not eligible for," Parmley admitted.

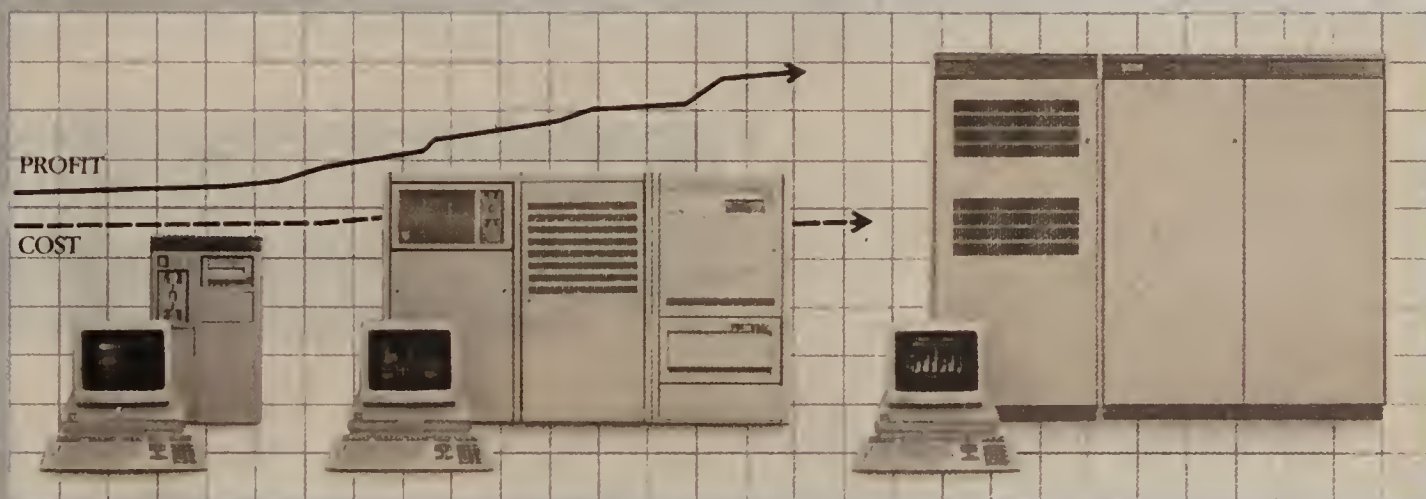
In September 1985, DHS tested and selected Revelation, a fourth-generation language from Cosmos, Inc. "Revelation met our requirements for handling large records," Parmley commented. "It has a flexible development environment and a good data base management package."

Revelation works with a wide range of networking products, including IBM's PC Network and approximately 30 network offerings that run under Novell, Inc.'s Netware software.

DHS will not know until August what vendors will be selected to supply the local-area network, communication interface as well as other hardware.

The agency gave no network cost projections. "Since there are bids still out, the less the vendors know how much we have to spend, the better off we'll be," England said.

Digital has it now.



The best way
to save the hidden
costs of expanding
your computer system.

Each time you expand a computer system, you pay hidden costs.

Because in most cases, expansion doesn't just mean buying a new computer. It also means buying all new software. And spending thousands of hours retraining staff and rewriting the software your company has developed over the years.

These hidden costs typically represent over 50% of data processing expenditures.

Not so with Digital. We keep costs down by offering the broadest range of compatible systems available. From our small-scale MicroVAX™ computers to our high-performance VAX™ computers.

And because our entire range of VAX-systems runs the same software, you only buy or develop software applications once. Which saves you thousands of dollars in software investment. And thousands of hours in software development. For applications as diverse as factory automation, office automation, engineering design, and scientific research.

What's more, our architecture and networking standards will never become obsolete. Programs for our first VAX computer still run unchanged on our very latest VAX 8000 series. And with our Ethernet networks, and commitment to industry standards, your previous computer investments remain useful parts of your system each time you upgrade or expand.

Let us show you Digital's systems in action at a company near you. Or at one of our 22 Digital Applications Centers for Technology. Simply call your local Digital sales office. And we'll show you how to save the hidden costs of your next system expansion.

digital™

You don't over



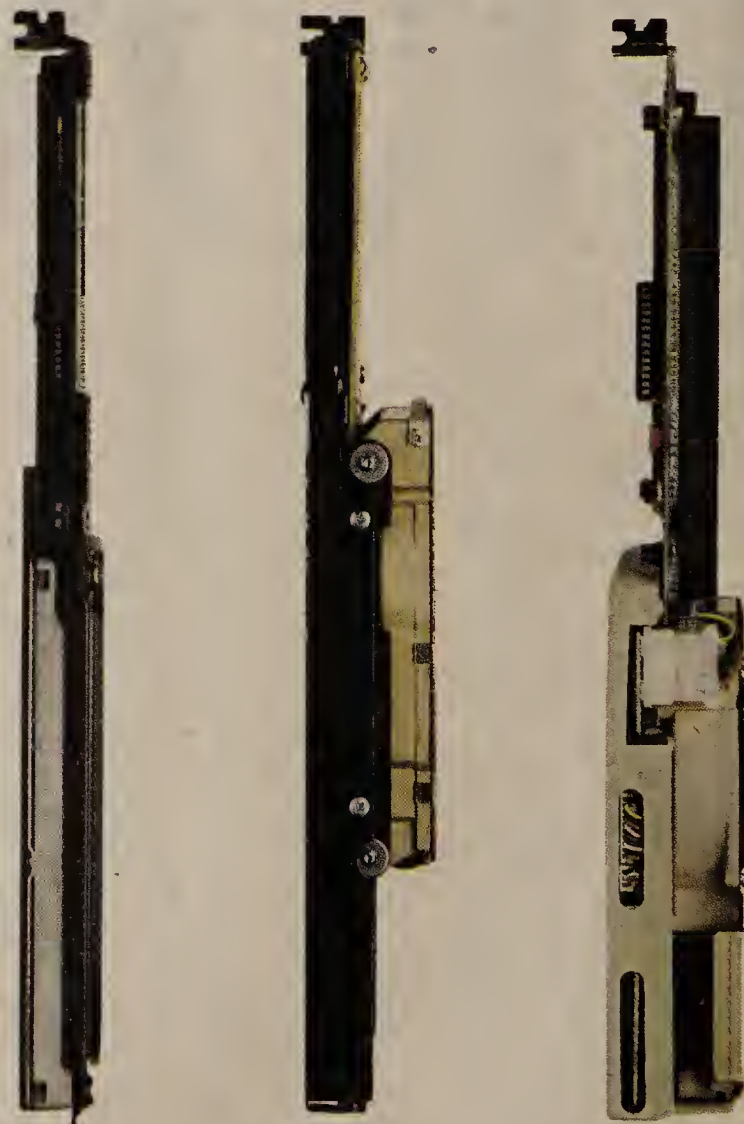
It took two years.
And lots of self control.
But making Hardcard™ thin
was the only way to make
it right.

And the only way to make
it fit into a single slot.

The other plug-in hard disks,
because of their portly profiles,
take up one and a half or two
slots. Hogging precious space
you may need in the future
for modems, memory boards,
network cards and turbo-
chargers.

Plus all the peripherals that

*Hardcard (left) is the only hard disk drive on a card
thin enough to fit in a single slot inside your IBM® PC,
PC/XT or PC-compatible. The other plug-ins take up
to two slots. They should try our reducing program.*



't get thin night.



Actual size.

are just now being invented.

Fat drives also tend to move slower. Gobble up more power. And endanger the health of your data.

So it's good to know that the same meticulous engineering that makes Hardcard slim makes its chances of failing even slimmer.

In fact, Hardcard has a reliability rating (MTBF) two to four times that of other plug-in drives.

So see your local computer

dealer for a demonstration.

Or call (800)826-8022 for the dealer nearest you.

But do it now.

A product this thin can move pretty fast.

Hardcard™ from Plus™



COMMUNICATIONS

Intellihub gets trial run

From page 37

lines."

Intellihub adds to the Pathway offerings two capabilities that reportedly will be standard Integrated Service Digital Network (ISDN) features, Cruz said. The first is dynamic network reconfiguration.

Through a terminal at the customer's premises to the Dynamic Network Controller at the local central office, customers can make real-time routing choices as to which long-distance carriers and services will be used as primary and backup links between New York Telephone premises and various area codes.

New York Telephone's Centrex customers can also make routing changes, "but they have to put in a change

order, which can take five days or two weeks to go through," Cruz said. "With Intellihub, it goes in instantly so you can take immediate advantage if, say, MCI Communications Corp. is giving a special discount for the month of June."

Intellihub customers also can enter a command to pull a faulty circuit off the line. One feature ISDN reportedly offers that Intellihub does not is dynamically reconfiguring customer premise-to-

central office bandwidth.

Call accounting gathers data on the length and frequency of both completed and unanswered calls handled by each circuit. Because New York Telephone is barred by Computer Inquiry II regulations from offering processing services at its central offices, users download the data over a Switched 56 circuit to their own systems for report generation.

New York Telephone, Northern Telecom and L. F.

Rothschild representatives appeared to have conflicting view about how Intellihub relates to the operating company's future ISDN services.

"Conceptually, it is ISDN," said the Rothschild telecommunications staff member, adding half-humorously, "But who knows what ISDN is?"

According to Northern Telecom, Intellihub offers the full range of ISDN capabilities, except for out-of-band signaling. The currently dominant ISDN specifications divide bandwidth into clear 64K bit/sec. B channels that transmit voice and data and separate D channels that carry signaling.

New York Telephone's Pathway service offerings use the T1 channel specifications that divide a 64K bit/sec. channel into 56K bit/sec. for voice and data and 8K bit/sec. for signaling. The Northern Telecom spokes-

”

'Conceptually, it is ISDN, but who knows what ISDN is?'

— Rothschild telecommunications staff member



Aren't you glad we have dial?

Paradyne presents dial modems with the same high performance you've come to expect from our leased-line modems.

Paradyne's family of dial modems offers the capabilities right for you—at speeds from 1,200 to 12,000 bps.

All models have a wealth of features, like Auto Call and Auto Answer. Automatic equalization and error correction. Plus the flexibility of standalone and nestmount versions, for sync and async applications.

FDX 12/24—Full duplex 1,200 and 2,400 bps dial modems

FDX/PC—Card version for IBM PCs and compatibles

HDX 9600/208B—Half duplex 9,600 bps modem with Bell 208B alternate rate of 4,800 bps

HDX 12000—At 12,000 bps the fastest dial modem available

Paradyne answers the call for dial modems with leased-line capabilities. Backed by our extensive service network around the clock. For more information dial —

1-800-482-3333.

paradyne

man added that New York Telephone will be converting to the ISDN "Clear 64" standard in 1987.

Cruz said that the Northern Telecom DMS-100s that handle the digital services already support Clear 64. He added, however, "I'm not sure that the U.S. will adopt Clear 64 or stick with 56K. The problem relates to the cost of converting existing wiring plants."

"The idea that 56K will become the ISDN standard is nonsense," said Daniel Rosenbaum, editor of "Wiretap," an information industry newsletter based in Morristown, N.J. He added that he thought that migration from 56K bit/sec. transmission to Clear 64 is "largely a matter of software. AT&T is already ready to do it."

For customers thinking about installing networking equipment before the industry completes its migration to ISDN, Rosenbaum suggested, "Leave yourself in the position to write it off. Changing from 56K to 64K will be largely a matter of changing multiplexers or coders/de-coders; how expensive it gets to be depends on whether you lease or buy."

Rosenbaum suggested that New York Telephone is starting out by offering ISDN-like services on existing 56K bit/sec. channels, planning to convert to ISDN specifications when the standards are in place.

SYSTEMS & PERIPHERALS



HARD TALK

Donna Raimondi

Thin-film woes finally aired

IBM and the plug-compatible manufacturers have been as open about IBM 3380-type thin-film head disk problems as the Soviet Union has been about Chernobyl. Big Blue and others pretty much follow the philosophy that if the users are not screaming to the press about it, it need not be aired publicly.

MIS managers have been complicitously quiet about thin-film technology problems. As long as the vendor will fix the problems, customers remain hushed in order not to embarrass or antagonize their vendor.

Now one company — Memorex Corp. — has decided to step out of the thin-film problem closet.

The company recently exposed a number of problems that have plagued it since it started offering the thin-film devices in 1984.

From the beginning of Memorex's disastrous experience with thin-film head disk interference — when the head hits the spinning disk — the company kept meticulous records of where, how and why the interferences occurred, said Cleayton Mills, vice-president of quality assurance.

The company discovered there were three basic flaws related to its 3680 disk drives: in parts of the head disk assembly design, in the architecture of several printed circuit boards and in customer computer room environmental specifications that were stringent enough for traditional disk architecture but not for thin-film head technology.

See **THIN-FILM** page 47

Raimondi is a Computerworld senior writer.

Ridge to roll out high-end work group network server

By James Connolly

SANTA CLARA, Calif. — Ridge Computers Co. today is expected to announce a high-end system providing high availability while operating as a network server for scientific and engineering work groups.

Ridge's 3200 Model 90 system was designed to provide superminicomputer performance with a reported processing speed of 5 million instructions per second (MIPS).

The high-end 3200 Model 90 system supports more than 100 users on workstations from Digital Equipment Corp., Apollo Computer, Inc. and Sun Microsystems, Inc. and personal computers such as the IBM Personal Computer AT and RT Personal Computer and Apple Computer, Inc. Macintosh.

Includes high-availability features

The Model 90 reportedly includes high-availability features not found on earlier models of Ridge's reduced-instruction-set-computer-based systems. Components such as CPUs and disks are redundant. The system also features a microprocessor-based service processor that manages remote diagnostics.

Ridge President Vernon Anderson said the Model 90 was designed to reduce downtime and the delays associated with time-sharing systems and that it offers the power to perform computationally intensive tasks such as simulation, which many network servers do not perform.

Ridge claimed that the Model 90 operates at 5 MIPS for integer applications and performs 4.3 million single-precision Whetstone calculations per second and 2.4 million double-precision Whetstone calculations per second.

Features 128M bytes of memory

It also features a maximum memory of 128M bytes and a sustained I/O transfer rate of 18.3M byte/sec. in burst mode, according to the company.

According to Ridge, the basic configuration of the high-end system includes 4M bytes of memory, a 78M-byte hard disk drive, eight RS-232 ports and a cartridge tape backup and costs \$36,650.

A more typical configuration, the company said, includes 8M bytes of memory, eight RS-232 ports, the ability to expand to 32 ports and a 150M-byte disk drive. That configuration costs \$49,900.

Plexus system targets small offices

By David Bright

SAN JOSE, Calif. — Targeting small departments that may be cramped for space, Plexus Computers, Inc. has rolled out a 16-user, Unix-based desktop system.

Called the P/55, the entry-level, Motorola, Inc. MC68020-based system can be expanded to accommodate 32 users. Multiple P/55s can also be linked to form a local-area network.

Available now, the system is intended for small to medium-size businesses as well as departments in Fortune 2,000 corporations and government agencies. "The P/55 offers smaller offices expandability at a much lower price than the P/75 while re-

taining the benefits of speed, reliability and broad communications capabilities," said Kip Myers, vice-president of marketing. Prices for the P/55 begin at \$25,250, compared with \$36,000 for the larger P/75 system. The new system is software-compatible with the P/75.

In its minimum configuration, the P/55 has 1M byte of memory, a 72M-byte disk drive and a 60M-byte tape drive and can be expanded to include 8M bytes of memory, 435M bytes of disk storage and a Motorola 68881 floating-point coprocessor. A network of P/55s can be created with the addition of intelligent Ethernet controllers and Plexus' Network Operating System.

INSIDE

Steven Jobs' Pixar announces shipments of its Pixar Image Computer/46

Burroughs introduces a printer for the financial market/46

International Power Machines offers a convertible power supply for mainframes/46

NEW THIS WEEK

■ Houston Instruments offers plotters and digitizers

■ For more on this and other new products, see pp. 85-107.

INSTANT ANALYSIS

"If you could marry the attributes of the 38 and the 36, you'd have an outstanding product."

— William Lowe, president, IBM Entry Systems Division

AWARD WINNER
\$25 Million ICP Award

There Are 48 Reasons Why You Should Have EPIC/VSE.

Here are 3 of them.

1. EPIC/VSE supported IBM's DOS/VSE SP2.1 the same day IBM announced it.
2. EPIC/VSE is SVA resident and fully re-entrant—gaining control only when there's work to be done.
3. EPIC/VSE requires exactly zero K for System GETVIS storage. (Another "leading" system gobbles up 400K or more.)

Tired of evaluating "me too" disk and tape managers? Take a good look at EPIC/VSE—the "me first" Resource Management System. A Tower Systems representative will show you an Evaluation Workbook. With it, you can learn why EPIC/VSE defines Resource Management. And you can make easy, direct comparisons, feature by feature, between EPIC/VSE and conventional disk and tape managers.

You have exactly four dozen reasons to call Tower Systems now.

EPIC/VSE. The First. The Best.

1-800-854-7551 In California: 714-650-4900
2220 Fairview Road Costa Mesa, CA 92627

TOWER SYSTEMS
INTERNATIONAL

SYSTEMS & PERIPHERALS

UPS maker offers 60Hz frequency conversion

By Stanley Gibson

DALLAS — While current mainframe computers, such as the IBM Series 3080 and 3090, require 400Hz power supplies, future computers may revert to the more common 60Hz frequency, according to International Power Machines Corp.

To cover that contingency, the Dallas-based maker of uninterruptible power supply (UPS) systems recently introduced a convertible frequency capability on its Endless Power UPS systems.

The enhanced Endless Power product can convert frequencies from 400Hz to 60Hz, and vice versa, maintaining a voltage tolerance of 1% with either frequency. In order to change the frequency, a service call of an hour or less is needed to exchange circuit boards and make some minor adjustments, according to an International Power Machines spokesman.

"Today's rapidly changing computer requirements mean that the data processing manager must have as much flexibility as possible. For example, his present IBM 4381, which operates on 60Hz, will be a 3081 or 3090 tomorrow and operate on 400Hz. And, who knows what the next generation will be?" said James deVenny, marketing vice-president at the firm.

"We're not predicting any-

thing. We're just making it possible to change," offered Lou Welt, marketing communications manager.

The new Endless Power systems, which are compatible with other Endless Power products, are priced from \$50,000 to \$65,000.

Jobs' Pixar ships image computer

By James Connolly

SAN RAFAEL, Calif. — Pixar has announced the shipment of its Pixar Image Computer to commercial and scientific accounts, three months after the company was acquired from Lucasfilm Ltd. by Apple Computer, Inc. founder Steven P. Jobs.

Pixar officials said the image computer is a high-per-

formance, general-purpose graphics computer. A key component of the \$122,000 system is its Chap channel processor, which uses a block-structured programming language and four parallel processors in a single-instruction, multiple-data architecture.

The company claims the processor performs 40 mil-

lion instructions per second. The system also has a 24M-byte, 2,000- by 2,000-pixel picture memory, expandable to 2,000 by 4,000 pixels.

In announcing shipments, Pixar said it has signed multimillion dollar OEM agreements with Symbolics, Inc. of Cambridge, Mass., and with Philips Medical Systems, Inc. of Shelton, Conn.

Introducing the

Now you can add high speed relational DBMS capabilities without subtracting power.

You really need a relational data base to support sophisticated and powerful business applications. What you *don't* need is the severe degradation an ordinary relational DBMS imposes on your VAX.

The Ultimate VAX is a far superior approach — one that actually enhances system performance when you add a high speed relational DBMS. Here's why...

First, our integrated hardware/software package is designed specifically for a virtual memory time-sharing environment with multiple terminals. Along with our data base management system, Ultimate includes a hardware engine — with up to 4MB of memory — so there's minimal need for VAX memory and CPU. Further, the data base and operating systems are partially implemented in *microcode* to dramatically reduce execution time.

Equally impressive is the advanced Ultimate Operating System. It's an enhanced version of the PICK™ System, used successfully in more than 60,000 businesses worldwide.

With dictionary-driven DBMS capabilities and fourth-generation languages, Ultimate's virtual memory operating system puts new flexibility and

convenience into the hands of both programmers and non-technical end users.

For starters, the Ultimate Operating System is co-resident with VMS®. This way, each user is free to choose the most appropriate operating system for every application. Then the power builds with Ultimate's UPDATE, a non-procedural language that simplifies file creation and maintenance. In addition, Ultimate's RECALL language lets users generate customized or ad hoc reports through English-like command sentences.

Ultimate's fourth-generation language also aids the programmer by cutting application development time from weeks to days. Already included are word processing and business graphics. And because the Ultimate VAX is based on PICK, more than 1,000 proven business applications are readily available. To protect your software investment, programs you create or purchase are transportable across the entire DEC® VAX product line, from the 750 through the 8800.

New power for your business applications is just a phone call away. Write or call today for details on the first relational DBMS that doesn't subtract power: 1-800-654-0134.



THE ULTIMATE CORP.

World Headquarters: 717 Ridgedale Avenue, East Hanover, NJ 07936 1-800-654-0134

It takes the ULTIMATE Commitment to outperform the competition.

ULTIMATE is a trademark of The Ultimate Corp. DEC, VAX and VMS are registered trademarks of Digital Equipment Corp. PICK is a trademark of Pick Systems, Inc. Member of The Spectrum Manufacturers Association, (SMA). "The Transportability Standard for Business Computers."

© 1986 The Ultimate Corp.

Printer targets financial mart

By James Connolly

DETROIT — Burroughs Corp. has introduced a near-letter-quality printer designed to be shared by multiple workstations.

The EF 4560 Advanced Multifunction Printer is said to feature an automatic alignment system that properly positions a document no matter how it is placed on the transport belt.

The printer is targeted at the financial market because of its ability to handle a variety of document types such as deposit tickets, legal-size documents, passbooks, signature cards and business envelopes. It also can read and print optical character recognition documents.

It can be shared by two intelligent workstations, such as the Burroughs B25 and EF 7000, via two RS-232 ports or shared by multiple workstations under software control.

Available now, the EF 4560 printer has a base price of \$3,600.

SYSTEMS & PERIPHERALS

Thin-film
woes aired

From page 45

The company focused its preliminary efforts on the head disk assembly. It discovered several flaws, including the fact that the lubricating film that sits on top of the disk was spinning off. The lubricant is supposed to reduce the heat and friction

that comes from the closeness of the head to the spinning disk.

The company made several fixes to its head disk assembly system by May 1985, and they incorporated the changes into their manufacturing process. For a while, all was well.

Then, in the summer of 1985, incidences of head disk interference increased again. Memorex claims that most of the incidents were caused by disks from its OEM supplier,

Data Media, Inc. Memorex severed its relationship with that company and replaced most customers' Data Media disks with Memorex disks, a company spokesman said.

Fixes lubrication problem

By the fall of 1985, Memorex had come up with a lubricant system that it says permanently fixed the lubricant-loss problem.

After all the hardware fixes, some customers continued to have problems

with head disk interference. Memorex, puzzled by the fact that the systems that came uniformly off its production line could act so differently at customer sites, started examining computer rooms.

The company found that the computer room environmental guidelines that worked a few years ago no longer provide the requisite safety for the new thin-film technology.

Memorex now urges customers to pay strict atten-

tion to staying well within vendor- and government-recommended guidelines for temperature, humidity and cleanliness. But customers may even have to go beyond those guidelines.

One key factor Memorex discovered is the importance of covering the computer room subfloor with an encapsulating paint to prevent miniscule particles of concrete dust from blowing in between the disk and head.

Memorex also found that computer rooms have hot spots, differing levels of humidity from one end of the room to another and minute particles of dust blowing in from air-conditioning systems.

The particles, which caused no problem with the traditional technology that kept the old ferrite heads flying 20 to 25 microinches above the disk, are a severe test of the new thin-film systems, in which the heads come as close as 11 microinches above the disk.

Initially reluctant to talk

At first, Memorex was a little reluctant to talk about its findings, one staff member said. The company was afraid it would look like only Memorex was experiencing these environmental problems; that IBM and the plug-compatible manufacturers were not.

But from *Computerworld* discussions with users of thin-film disk systems that came from different vendors, it appears the problems are universal.

Users who experienced mysterious head disk interference fixed the problem by renovating the computer room. Indeed, they found that painting the subfloor, correcting heat and humidity regulators so the room was evenly balanced and establishing a proper airflow virtually eliminated thin-film head disk problems.

It is a good day when a vendor comes out in the open with revelations of this nature. Memorex's confessions should enable thousands of MIS managers — not just Memorex customers — to avoid the headaches and the financial burden of living with head disk interference.

Now, wouldn't it be nice to hear from IBM and the other manufacturers about their experiences with thin-film technology?

UltimateTM VAX.[®]



NEW REPORT WRITER FOR ORACLE[™] USERS

Create complex reports from your Oracle database with easy one step process. Report format and logic very flexible. Versions for VAX/VMS, IBM PC. Demos available. Contact Stern Consulting, P.O. Box 21171, Cleveland, OH 44121, (216) 397-0551.

Oracle is a trademark
of Oracle Corporation



THE FASTEST WAY
TO MAINTAIN COBOL CODE.

INTRODUCING FASTBOL.

When you're in the maintenance game, you're playing with your company's time and money. So you need the best help you can get. Which is why you should know about FASTBOL.™

FASTBOL speeds up COBOL renewal by giving you intelligence about the program from the program itself. Which makes information that took hours of effort to extract, available in seconds. On-line and in real time. And FASTBOL works within your VM and MVS editor environments, so you can make changes and check their effect immediately.

In addition, FASTBOL is easy to use and provides a lot of on-line help. Which means you'll be productive in hours, not weeks.

So if you're serious about beating the maintenance problem, you should take a serious look at a winner.

FASTBOL. It's in a league all by itself.

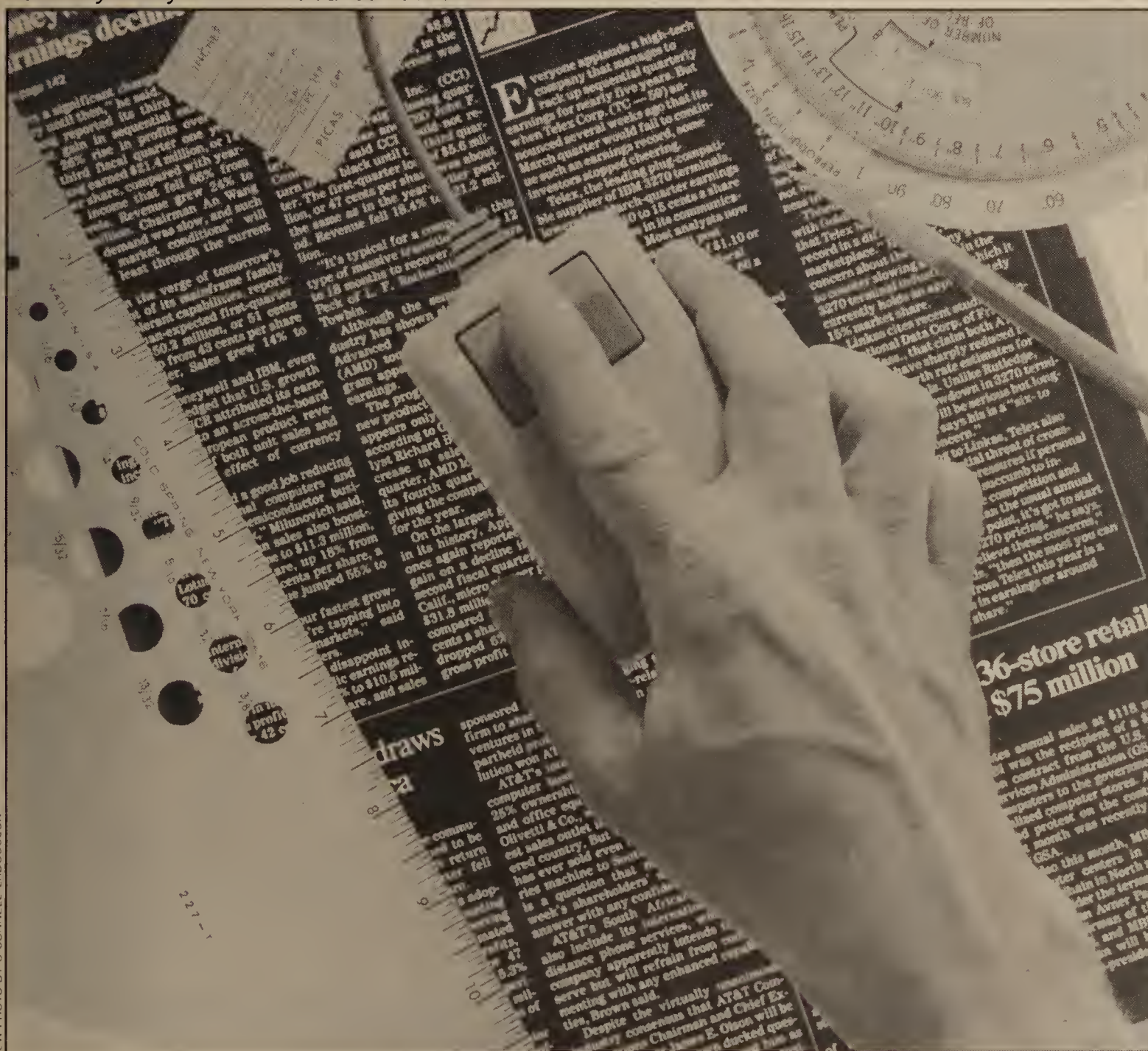
For more information on FASTBOL and a 30-day free trial, call 1-800-553-1200 or write to FASTBOL, One Jacob Way, Reading, Massachusetts 01867.

FASTBOL is a member of *The Cobol Renewal Series*.™

FASTBOL™

Executive Report

Edited by Becky Batcha and Janet Fiderio



CW PHOTO BY O'CONNELL LADOUCEUR

INSIDE

Don't let the lack of standards hold your shop back/50

Apple's Mac vs. IBM's PC: A debate on desktop options/55

Large-scale systems promise speedy performance, polished results/58

Single-user systems offer easy, inexpensive route into publishing/60

Current users give practical advice on getting started/62

In-house publishing

DP can prosper by tapping print systems' potential

By MICKEY WILLIAMSON

Computer-based publishing presents MIS managers with both tremendous opportunity and great challenge.

The opportunity is to take the lead in adopting an emerging technology that can show a striking impact on the bottom line. Without knowing much at all about the technology, companies can easily achieve a 30% annual return on investment, according to Paul Lewis, director of operations at Interconsult, Inc., a market research organization based in Cambridge, Mass. With good management, Lewis says, the annual return can reach 50% to 60%.

The challenge is to overcome traditional views of the MIS department and its managers, who often appear averse to innovation and uninterested in business beyond the collection and reporting of data. MIS managers often look at in-house publishing as a necessary evil, according to Keith Davidson, executive director of Xplor, an association for users and managers of advanced electron-

ic printing equipment. "You do printing to get the data out of the way of the mainframe so you can get back to processing data," he says.

But electronic publishing seems destined for glory, with the production of hard copy emerging as an integral part of information management. Most experts agree that those MIS managers who do not want to preside over the gradual erosion of their department's importance must start now to learn about computer-based publishing and introduce it to other people in their companies.

Davidson states the case forcefully: "I don't think MIS managers can afford to wait for management initiative if they intend to remain in the forefront of their company's requirements for managing information resources," he says. "I think they should lead the charge."

Electronic publishing is attracting considerable attention throughout the corporate hierarchy:

- Executive managers who want to minimize costs, cut document inventories and improve turnaround time are quick to see possibilities in computer-based publishing.

- Technical managers find it attractive because it meets a critical need for keeping proposals and technical documentation open to change.

Companies can save 50% and more if someone coordinates document production efforts. MIS managers seem well suited to the task.

Williamson is a technical journalist based in Warwick, Mass. She is the author of Artificial Intelligence for Microcomputers (Simon & Schuster, Inc., 1986).

MIS can tap print systems' potential

Continued from previous page

• People with personal computers on their desks hear about desktop laser printers and the software that drives them. If these users have not already done so, they are probably scheming to tuck funds for personal publishing capabilities into next year's operating budget.

All of these people will need advice and guidance in using their computers, and where better to get it than from the computer room?

Few companies know how much they spend to publish the forms, reports, brochures, proposals, catalogs, parts lists, instruction manuals, telephone directories and employee newsletters without which commerce would grind to a halt. This year, the expense will equal between 6% and 20% of gross corporate revenues. Increasingly each year, publishing is the second line of business for virtually every corporation.

Typically, funds for document preparation and production are spread among a dozen departmental budgets, controlled by a dozen managers, none of whom know what the others are doing. By pooling these efforts through a centralized electronic publishing system, companies can realize savings of 50% and more in their document production costs.

At Standard Motor Products, Inc. in Long Island City, N.Y., MIS manager Ashok Dudakia presides over a well-coordinated operation. Electronic typesetting machines draw directly on a corporate data base of thousands of automobile parts to produce polished catalogs and price sheets.

In the shop, clerks maintain the data base using Data General Corp.

10XP microcomputers and IBM Personal Computer XT's and AT's. A local-area network links the micros to two DG minicomputers, a disk storage device and a typesetting machine — Autologic, Inc.'s Micro V.

EIT, a software package from Electronic Information Technology, Inc. ties the auto parts data base to a data base of typesetting codes, thereby coordinating the two. "You can pull a field from the data base and automatically put in the codes you need," Dudakia says.

With the system, Dudakia's staff can automatically merge enough text elements to produce simple finished pages, a process known as pagination. More complex pages require some manual page pasteup.

The in-house electronic publishing operation lets Standard Motor keep its annual typesetting costs very low.

"If we went outside to typeset our catalogs, it would cost us about \$475,000 for everything that I'm doing," Dudakia says. "Doing it in-house costs \$215,000, including employee benefits."

Another user organization, Bank of the West in San Jose, Calif., has also taken advantage of electronic publishing to shave costs. Most of the bank's savings come not from bringing typesetting in-house but from automating previously manual design tasks and making revisions easier.

Bank of the West publishes 650 different forms and seven manuals for in-house use. Before the bank acquired an Interleaf, Inc. electronic publishing system in November 1984, it relied on manual pasteup, a highly labor-intensive process, for the production of the documents. Every time new banking laws and regulations forced changes in the forms' contents, the bank had to repeat the entire pasteup process, starting from scratch.

With electronic page makeup, legislative and regula-

tory changes pose less of a problem, according to Susan Mesches, a bank vice-president and manager of administrative services. Bank of the West can store the forms it creates electronically and recall them when necessary for quick, inexpensive on-screen revisions. Mesches estimates that the cost of producing proof pages has dropped by a third.

Bank of the West paid \$60,000 for the Interleaf system and expected full payback within five years from savings of \$13,500 a year. At the end of the first year of operation, savings had already reached \$18,000, Mesches says.

Cost savings are not the only benefits. In-house electronic publishing lets a company take firm control over its document production. Publishing systems support on-demand printing, where a system produces only the number of documents needed at a particular time; in addition, they allow printing to take place at the last possible moment, to incorporate the latest information.

Computer-aided publishing also provides nearly effortless merging of text and graphics and allows companies to produce documents that look professionally typeset.

Graphics are becoming a necessity in business communications. Executive managers expect data to be accompanied by images, and assembly and repair manuals require a liberal sprinkling of illustrations in order to be effective.

Typeset text can be read faster and comprehended more easily than typewritten text or text produced on a matrix printer. The typeset page holds more words, making documents less bulky and, to complete the circle, saving money on paper and paper handling.

Beyond these organizational benefits, electronic publishing satisfies individual users' gnawing de-

sire for creativity. "Users want to express ideas," says Bernard Peuto, president of Concord Consulting in Menlo Park, Calif. "They want power and control."

These users, intent on their own performance, will not wait for long. Frank Yee, a salesman for Symbolics, Inc. in Los Angeles, is typical. Yee uses an Apple Computer, Inc. Macintosh and Laserwriter with Boston Software Publishers, Inc.'s Macpublisher II software to publish a new-product newsletter for his customers, gleaned from the information from company memos. "If I didn't do it this way, I couldn't keep them up-to-date," he says.

Yee paid for the hardware and software out of his own pocket. "I'm just a guy who has a job that has to get done," he explains. "If I tried to do this through regular company channels, it wouldn't happen."

Yee's lament may seem familiar to anyone who sat in charge of MIS when personal computers started making their way into the corporate environment.

"I suspect that what will happen is basically the same thing as the way PCs and Macs sneaked in the doors," says Zack Deal, coordinator of electronic publishing at Harvard University's Office for Information Technology. "You'll have people bringing in fancy laser printers and doing more and more of their own publishing before the MIS managers have anything to say about it."

The personal computer experience of the past bears directly on today's electronic publishing experience, according to Andy Plata, president of Computer Output Printing, Inc., a service bureau based in Houston that consults in electronic printing.

"If not for the infiltration of PCs, most data processing managers would not even allow this to be discussed

Continued on page 55

Expert Advice

Don't wait for standards

After their experience in trying to get personal computers to communicate with each other and with the rest of the corporate computer system, MIS managers may worry about the widespread lack of standards in electronic publishing.

But they should not let that stop them from forging ahead, according to many experts. In the field of corporate electronic publishing, he who hesitates loses out.

"Wait for standards and you'll never get in," advises Toby Cobrin, president of Xplor, an electronic printing users' group, and vice-president of Comvestrix Corp., a service bureau in Lyndhurst, N.J. Cobrin feels strongly that the lack of standards should not deter companies from adopting the technology today.

Paul Lewis of the market research firm Interconsult, Inc. in Cambridge, Mass., agrees. "Whatever investment people make today will be well worth the buck, even though they may decide two or three years from now to make a complete change," Lewis says. "It's not a good idea financially and in many other respects simply to sit back and wait for things to happen."

Lewis does feel, however, that each company should be concerned with compatibility among its purchases. Unless every component in a publishing system uses the same codes for specific tasks, chaos is sure to result. Compatibility is a serious issue.

Alphanumeric characters present no problem; all computer-aided publishing systems understand standard ASCII code. But other elements can cause trouble:

- Formatting codes — for page headers and footers, centering, column alignment and so forth — vary from one vendor to another, and few of them work reliably together.

- Codes for describing the printed page to the printer also vary across systems. Xerox Corp.'s Interpress and Adobe Systems, Inc.'s Postscript are currently more popular than most page description languages. System vendors tend to support one or the other — not both.

- Disparate codes for storing and producing graphic images make matters worse.

Eventually, a couple of sets of standards will emerge, and integrating a system will be considerably less difficult, but standardization still lies at least three years away.

Zach Deal, coordinator of electronic publishing at Harvard University's Office for Information Technology, thinks that's too long. "If you wait for standards, you're talking about three years of lost possibilities," he says. "I would not be surprised if the cost of lost possibilities is greater than the cost of buying something now and having to buy something else a few years down the road. Besides, you get much further up the learning curve if you jump in now."

— MICKEY WILLIAMSON



”

The MIS guy has never given consideration to aesthetics. How he's going to change all of a sudden, I haven't the foggiest idea.

Thomas Dunn
Dunn Technology, Inc.



”

That's a good point. But it's just as valid to say the print shop should stay out because of the programming involved.

Keith Davidson
Xplor users' group

Is your LAN server built to weather the storm?



A funny thing happens when a workstation-turned-server faces the storm of heavy use typical of a local area network. That is, of course, if you find poor performance funny.

Novell doesn't. As the developer of NetWare, the high-performance LAN operating system, Novell understands the importance of powerful LAN servers. Servers that won't sink under the first wave of network user demand.

Built to Perform.

If you expect that kind of performance, the NetWare Servers will live up to your expectations. Designed for high-performance LANs, NetWare Servers are true servers, not modified workstations. So they run faster and give your LAN unsurpassed functionality and flexibility.

Offering superb performance and high-capacity disk storage, the 80286-based NetWare Servers 286A and 286B are compatible with all major LAN systems. The powerful 68000-based 68B supports the NetWare S-Net and the ARCNET68 LAN topologies.

Equipped to Outperform.

Adding to the NetWare Servers' unmatched performance/cost ratio is the inclusion of Advanced NetWare with each server, plus free upgrades to SFT NetWare Level II. With over 200,000 users and 3,000 multiuser applications, NetWare is the LAN operating system standard for performance, reliability, compatibility and connectivity.

Give yourself the benefit of a server that will keep your LAN afloat even under the toughest conditions. The NetWare Servers. For more information, visit an Authorized NetWare Dealer or call 1-800-LANKIND.



 **NOVELL**

Milestones Ahead.

Introducing

By far, the best resolution



the WY-60. to your terminal needs.

It's everything we know you want in an ASCII terminal, and then some.

Great resolution. Hidden attributes. Multiple personalities, with emulation of just about anything you'd ever be interested in emulating. Multiple display formats, with up to 132 columns and 44 lines of information on one screen, to get the most out of even the most complex applications. And soft fonts, so it can be crisp, clean and easily readable in any language, including those you may care to invent.

We've even added WYSE-WORKS, a nifty clock/calendar/calculator combination, for extra productivity.

You choose the screen color, and the keyboard layout that suits your application: Wyse WY-60, IBM PC-AT or IBM 3161. The adjustable arm option lets you choose the perfect height and screen position. You can even choose the service plan that works best for you, from a range of options.

Behind the WY-60's innocent good looks is actually the

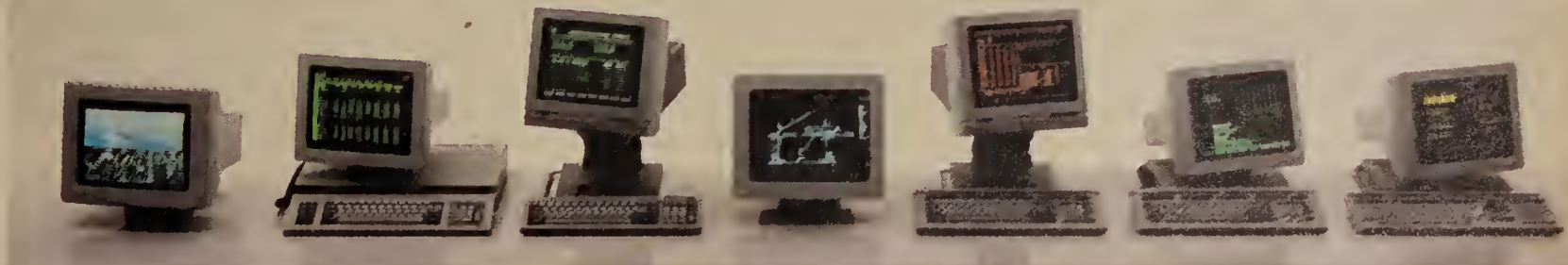
face of unparalleled experience. When it comes to terminals, we ship more than anybody but IBM.* So it's natural we'd come

up with a terminal with a lot of years of wisdom behind its good looks.

Call toll-free or write, today, for more information.

WYSE

YOU NEVER REGRET A WYSE DECISION.



- ☐ Yes, please send me detailed information on the WY-60 and the entire Wyse product line.
- ☐ I'd like to see a demonstration of the WY-60.

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Mail to: Wyse Technology, Attention: Marcom Dept. 60
3571 N. First Street, San Jose, CA 95134

C-5/26/86 Call 1-800-GET-WYSE

FOUR EASY WAYS TO KEEP UP WITH THE JONESES.

ORDER ENTRY

BER 64478

TO Mr. William Jones

SHIP

Standard Hardware Supply

8518 North Center Street

Fullerton, MI 48021

CREDIT LIMIT APPROVED

SHIP ON DEMAND

Set Up Mode/Dynamic Color Assignment: Assigns two colors to unprotected fields, making changes in data more visible.

T875	TOOL CHEST 4DWR	23	20	3	10
W834	WRENCH 4 INCH	15	10	5	10
S804	SCREWDRIVER 4 INCH	70	500		
P402	PULLY 8 FEET	25	200		
W443	WRENCH 4 INCH	15	10	5	10
N025	NAILS 1 INCH	1000	700	300	700

HOST	Channel	LOCAL	Coax/Twisted Pair	DISP
CPU	=====	TERM.		
	===	CONT.		
	"			
	"			
	"	FRONT		
	"=====	END	DCE	

Set Up Mode/Split Screen & Scrolling: Provides simultaneous access to two sessions, and determines how much of each session will be seen.

CUSTOMER IDENTIFICATION		INVOICE	
OF THE FOLLOWING:		NUMBER	DATE
CUSTOMER ACCOUNT NUMBER		32005	8/05/83
CUSTOMER NAME	M	32775	3/26/83
CUSTOMER STREET ADDRESS		25019	2/19/83
UNIT SERIAL NUMBER		10321	1/07/83
DEPRESS <ENTER>		11350	11/05/82
		10663	10/25/82

Set Up Mode/Screen Size: Assigns screen size according to application, allowing one terminal to do order entry and accounting equally well.

PART NO	DESCRIPTION	QTY ORDER
3548	BOLTS 2 INCH	6
T875	TOOL CHEST 4DWR	23
W834	WRENCH 4 INCH	15

Set Up Mode/Variable Field Underline: Underlines all variable fields—speeds input when standardized forms are being used.

Tracking and updating information is one of your company's most important jobs. How well you do it depends almost entirely on the terminals you use.

So you owe yourself a good look at ITT Courier's 9000 series terminals and our exclusive 3270 Set Up Mode. Together, they allow you to customize your screen formats so only the information that needs attention gets it.

You can set alarms so you can spot a mistake the second you make it. Assign eye-catching colors to critical information fields. And even make the fields blink.

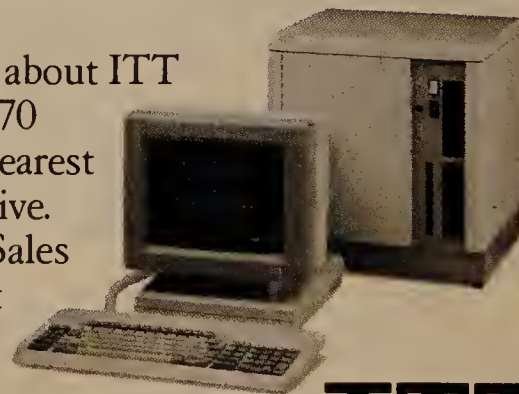
Once selected, the options can then be stored on the controller diskette, saving you the time and

hassle of recustomizing your screen each time a new application is accessed.

All told, there are 100 Set Up Mode features and 6 ITT 9000 series terminals for you to choose from.

Any combination of which will make it easier to keep up with the Joneses. And ahead of your competition.

For more information about ITT Courier's entire line of 3270 terminals, contact your nearest ITT Courier Representative. Or call the ITT Courier Sales Support Dept., toll-free at 1-800-528-1400.



ITT COURIER **ITT**

Executive Report/In-House Publishing

Continued from page 50

around them," Plata says. "Today, they realize that unless they do get involved in figuring out how to use this equipment and integrate it, people will have stand-alone systems in their offices."

Indeed, Plata tells of one company in which five laser printers do the work that one could handle because the DP department refused to step in and manage.

Xplor's Davidson thinks there is a lesson to be learned from the advent of personal computers. "I believe that the proliferation of PCs in most corporations probably exceeded management's best judgments about how it should have been done — that there are too many of them and too

many different types," he says. "If they had it to do over again, most corporations would try to be more consistent."

Davidson recommends that MIS managers coordinate the acquisition of electronic publishing equipment with an eye toward users' needs, paying careful attention to the requirements of each operating department.

□ □

A four-step plan for decisive action

Another relevant lesson from the history of the corporate PC is that

MIS managers who do not get involved in the adoption of new technology get bypassed as the technology takes hold. MIS managers need to recognize computer-based publishing as a mainstream information processing technology and approach it as such.

Getting involved in the implementation of an electronic publishing system means taking a number of actions right away:

Step 1. Find out how the company currently publishes its documents.

The manager who seeks to implement an in-house electronic publishing system needs to know exactly how his firm's document production works right now. To find out, he

should ask the following questions:

- What documents are being published, by what departments, in what quantities and through what processes?

- Where do each document's text, data and graphics components originate?

- How do the various components get incorporated into the document?

- What are the costs in labor and materials?

- Are documents printed within a centralized in-plant print shop, on departmental laser printers, at a commercial printer or service bureau or in a variety of locations?

- How long are lead times for printing documents?

Continued on page 56

Debate

What micro should MIS sanction for desktop publishing?

IBM's PC: Use what you've got

By ARLENE KARSH

Apple Computer, Inc.'s Macintosh holds an early lead in the desktop publishing race, but the IBM Personal Computer keeps gaining ground. And, in spite of its bad rap as a nongraphic, nonaesthetic, data-driven box, the PC will ultimately emerge as the winner.

Whereas Apple pioneered desktop publishing as a specialized application for graphics designers, its real potential lies in the broader office and business market. In this market, the IBM Personal Computer is already the workstation of choice.

Millions of PCs and compatibles operate in American businesses. Common sense dictates against bringing in additional hardware dedicated exclusively to creating documents. Moreover, vendors are devoting considerable energy and money to ensuring that the mainstay of the business community adapts to the rigors of producing aesthetically appealing documents.

Recent developments in operating environments, page composition software and peripherals give the IBM PC the highly graphic, interactive, user-friendly attributes associated with the Mac — all de facto requirements for page composition.

- **Operating environments.** Products like Windows from Microsoft Corp., Topview from IBM and Graphics Environment Manager from Digital Research, Inc. provide the IBM PC with multiple on-screen windows, pull-down menus, pointing devices and zoom and pan capabilities. These features all come in handy for integrating and viewing the many text and graphics images required for page composition.

- **Page composition software.** Many of the major suppliers of Mac-

intosh desktop publishing programs are expected to release IBM PC versions within the year. Other software developers, including Ventura Software, Inc., T/Maker Corp. and Bestinfo, Inc., have already displayed impressive preview versions of easy-to-use page composition programs for the PC; these programs should ship soon.

Established publishers of IBM Personal Computer software like Microsoft, Micropro International Corp. and Lotus Development Corp. also seem poised to enter the PC-based desktop publishing arena.



- **Peripherals.** Page description languages allow PC software to produce full-page text and graphics output on a wide variety of printers, including the highly touted Apple Laserwriter. And software packages from vendors like Bitstream, Inc. and Compugraphic Corp. give Personal Computer users access to many typographic fonts that provide professional hard-copy output, despite the standard PC's relatively poor screen resolution.

The PC's open architecture encourages these and other efforts and will allow the machine to expand as a publishing system. Thanks to its ubiquitous presence in business and vendors' intent to keep it that way, the PC will flourish as a platform for office desktop publishing.

The real contest, in fact, is not between the Macintosh and the PC. Rather, it involves the many emerging vendors that hope to provide the most successful desktop publishing solutions for the IBM PC.

Apple's Mac: Use what works

By JAMES CAVUOTO

Corporate edicts that say "Buy IBM" have thwarted many would-be in-house publishers. Apparently, some DP managers feel that the desire for the graphics interface afforded by the Apple Computer, Inc. Macintosh's mouse and pop-down menus is nothing more



than an affectation.

This attitude is counterproductive — and unprofitable — for American business. If a company wants to accomplish its goals, it needs to use tools that work. And as matters stand right now, those tools are the Apple Macintosh and Laserwriter and associated page layout software packages.

The Apple system works right now. It works better than any other option. And it works for the lowest amount of money.

The Macintosh's design makes it the most appropriate personal computer for publishing applications. The machine features a high-resolution graphics display and internal support for multiple type fonts and sizes. It offers a consistent and easy-

to-use mouse interface, and it runs on a high-performance Motorola, Inc. 68000 processor.

In contrast, the IBM Personal Computer supplies only an 80-column, monospaced display. Its character set is missing several important publishing symbols such as the em dash (—) and bullet (•). And it lacks a standard graphics display and printing environment — factors that impede software development.

Admittedly, several IBM PC-based programs under development promise much of the performance of a Mac. But six to 12 months will pass before these programs are readily available and debugged.

In the meantime, many users can easily save the cost of a Macintosh (about \$2,000) by using it to produce documents that would otherwise require expenditures for typesetting, graphic design, revisions and reproduction. Even if better software for the IBM PC arrives a year from now and a company needs to throw away its Macintosh, the machine's temporary use would be cost-justified.

Companies cannot write off the \$6,000 Laserwriter printer as quickly, but they have no pressing need to do so: It will not be a candidate for the garbage can for quite some time. No matter which microcomputer it supports — the Macintosh or the IBM PC — it is now and will continue to be the best laser printer available for desktop publishing.

Because of the powerful and flexible Postscript language from Adobe Systems, Inc. built into the printer, many software packages for the IBM Personal Computer — including Microsoft Corp.'s Microsoft Word, Ventura Software, Inc.'s Ventura Publisher, Studio Software Corp.'s Do-It and Bestinfo, Inc.'s Superpage — will support the Laserwriter without any modification.

But these are future concerns. For now, the bottom line should serve as the guiding force in office publishing. Users of desktop publishing systems and the managers that oversee purchases should concern themselves with supplying a cost-effective solution, not with satisfying corporate requirements for standardization.

Karsh is director of the Computer Publishing Systems Market Requirements Service at C. A. Pesko Associates, Inc. in Marshfield, Mass.

Cavuoto is editor and publisher of "Micropublishing Report," a monthly newsletter. He works out of Redondo Beach, Calif.

Executive Report/In-House Publishing

Continued from page 55

From the answers, the manager can uncover inefficiencies and determine exactly what benefits might accrue from the relatively inexpensive, on-demand print capabilities that an in-house system provides.

At this stage, the manager should also seek the answer to one highly strategic question: If publishing operations are already distributed throughout the company, is it too late to coordinate them?

Step 2. Learn as much as possible about electronic publishing technology and techniques.

To use the information he gathers in the first step, the manager needs to find out how electronic publishing systems work and how they can improve his firm's operations.

He should read enough magazines,

newsletters and books to gain familiarity with the terminology and trends in document design and production, and he should explore vendor literature as well.

Lest all this study remain in the abstract, the manager should sit down in front of a personal computer and work with a desktop publishing package. "Education is the most important thing," says Standard Motor's Dudakia. "Get it on your desk and learn, and you'll be way ahead of the game."

The process of self-education should run parallel to the fact-finding mission so the manager can get through both steps as soon as possible and move on to more concrete action.

Step 3. Seek preliminary support from upper management.

Armed with some knowledge of the company's needs and of solutions currently available in the marketplace, MIS can approach management with a recommendation that a task force be formed for further exploration of electronic publishing.

The group should draw members from every department that holds an interest in producing readable documents. Discussions should focus on determining what documents the company produces and meeting the needs of the people who produce them.

Once task force members agree on what they want, they should draw up a wish list for a corporate publishing system, leaving nothing out. They can then call in the vendors to find out what the company can reasonably accomplish with an expendi-

ture that will pay for itself within three years.

Step 4. Establish MIS as the coordinator of system installation.

If the MIS manager follows the first three steps, he should be able to convince top management of his ability to handle the business and technical considerations of corporate electronic publishing. With management's sanction, he can position MIS to lead the charge.

If he cannot sell corporate executives on his shop's abilities, management may assign the task of installation and integration to someone less capable, and the system may fail miserably.

The experience of one military contractor is instructive. The contractor in question tried, without success, to integrate its text and graphics publishing capabilities. Two members of its electronic publishing task force told the firm's story on condition that no names be used.

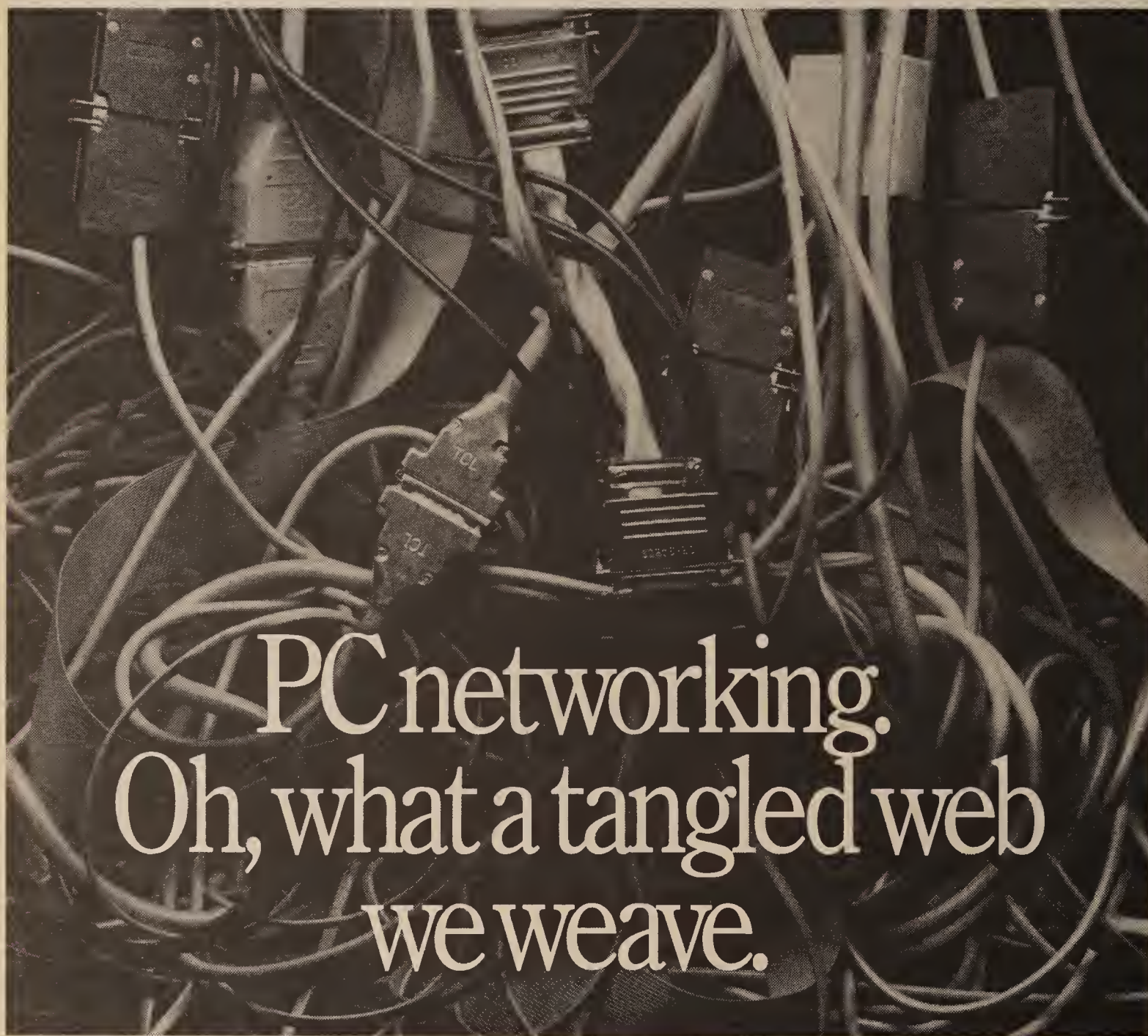
The company makes military equipment — machines with as many as 20,000 parts, requiring operations and service manuals that are 5,000 pages long. Employees from a variety of departments contribute to production:

- Writers and editors in the technical publications department produce text on Wang Laboratories, Inc. word processors.

- Engineers and technical illustrators use computer-aided design and manufacturing (CAD/CAM) systems to produce some drawings, but they draw highly complex designs by hand. (One of the major benefits of the firm's proposed computer-aided publishing system was the ability to scan these drawings digitally into the engineering data base.)

- The copy center and reprograph-

Continued on page 58



PC networking. Oh, what a tangled web we weave.

NBI unravels the mystery surrounding PC networking.

NBI was one of the first companies to recognize that isolated PCs often cause as many problems as they solve.

So we took a long, hard look at PC networking. And figured out how to do it right.

In fact, we've been networking PCs longer and better than any other office automation company.

The NBI PC networking system, which we call "clustering," is completely compatible with IBM and other mainframes. And we let you hook all of your existing IBM PCs together.

NBI offers you a total solution, including cabling and software support. At an excellent

price. We're also recognized as having the best service record in the industry.

So don't weave a tangled web. Call 1-800-922-8828, ext. 505 or fill out this card so we can start unraveling the mystery surrounding PC networking.

NBI

NBI, Inc., 3450 Mitchell Lane
Boulder, CO 80301
1-800-922-8828, ext. 505

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone () _____ CW

What to seek in software

To a great extent, software determines the visual quality of electronically published documents and the ease with which they are produced.

Publishing software should allow the person responsible for the document to see what each page will look like before it is printed, a phenomenon known as WYSIWYG (pronounced wizzy-wig): What you see is what you get.

Generally, good publishing software should meet four other criteria as well:

- It should allow users to arrange text in columns and insert graphic images.

- Material should flow automatically from one column to the next or from one page to the next when editorial changes are made.

- Footnotes should stay on the same page as the text to which they relate.

- When the user moves a figure from one place to another, the software should automatically renumber both the figure and all references to it in the text.

— MICKEY WILLIAMSON

The IBM Proprinter. Now in a wide variety.



Introducing the Proprinter XL.

It's the wide carriage version of our popular Proprinter—the versatile printer made for personal computers.

And, as you might expect, the IBM Proprinter XL does everything the original Proprinter does. Only it does it wider.

Which means you can print spreadsheets, flow charts—almost anything—up to 16½ inches wide.

But wider isn't all that's new about the Proprinter XL. For example, there's a three-button operator panel on the front that, among other things, lets you choose among three printing speeds. From a fast 200 characters per second to a sharp, near-letter-quality 40 characters per second.

You can also choose double-high characters—particularly useful for presentation charts—and

proportional spacing. There's even a quiet mode.

And because the IBM Proprinter XL is a Proprinter, there's an easy way to print on envelopes, letterheads and single sheets without removing the computer paper. It also works with IBM PCs, other leading personal computers and most popular software. Yet it costs less than \$800.

The IBM Proprinter XL. It's just one member of the IBM family of personal printers. All are designed to give everything you print the finishing touch.

For the authorized IBM dealer or the IBM Product Center nearest you—or for free literature—call 1 800 IBM-2468, Ext. BI/90. Or contact your IBM marketing representative.

IBM Personal Printers...The Finishing Touch.

Continued from page 56

ics department takes camera-ready copy and produces finished documents.

• The office automation department has budgetary responsibility for equipment used by the engineering and technical publications departments.

When the firm started its project to integrate text and graphics production, it formed a task force that included people from all relevant departments. Initially, the members felt eager to cooperate and share resources. Unfortunately, future events wrecked the team spirit.

"When we presented the project to management, it was too complex for them to understand. They couldn't tell which pieces represented the most benefit for the busi-

ness," says one member of the task force. "They asked for it to be taken apart, so we unbundled it and presented it a piece at a time."

As the task force prepared the revised presentation, members from the various departments became reluctant to give up control. Before long, an interdepartmental struggle arose over who would integrate the system. Despite the objections of both the MIS and office automation departments, the struggle ended in the selection of a vendor that lacked the requisite know-how.

As a result, text and graphics for manuals and proposals are still being produced separately and pasted up by hand to produce camera-ready pages.

Sadder and wiser, the company will eventually integrate text and

graphics. But implementation will come slowly. "It's going to take some sensitivity and awareness, which now we have," one participant says.

Making the case for the MIS manager as czar

Computer-based publishing draws from a variety of disciplines. Word processing, data processing, applications development, graphic design and printing all come into play in the production of almost any corporate document. Other functions, such as telecommunications and CAD/CAM, may also get involved.

Among operating departments,

Continued on page 60

The high end: Performance, sophistication

By BARBARA MCLEAN and BERNARD PEUTO

No one electronic publishing system can handle all of a typical Fortune 1,000 company's publications. As a consequence, there are a variety of electronic publishing systems being used for those tasks:

- Low-end, single-user desktop publishing systems effectively produce shorter newsletters and reports (see story page 60).

- Mid-range systems process long documents but with limited typographic quality. These systems most often work well where office automation systems are used today.

- High-end systems produce sophisticated documents of unlimited length, composition or typographic quality. High-end systems work well in companies in which the internal publishing group already has a typesetter.

Where mid-range and high-end systems differ from desktop publishing systems is in their ability to offer multiuser facilities to corporate professional publishing groups of three or more people. The primary distinction between mid- and high-range systems is their level of pagination sophistication. A high level of pagination sophistication usually indicates an accompanying high level of typographic sophistication.

Mid-range systems. The cost to configure a mid-range system that includes a workstation, usually an IBM Personal Computer AT or equivalent, with laser printer and all software is between \$15,000 and \$25,000. By replicating the workstation and adding a network, these systems can support four to six people.

In this work group environment, some of the workers will use standard word processors to generate text. Someone will be using a drawing package, and the graphic artist in the group will be using a page make-up program. All software will be running on personal computers.

These systems are ideal for mid-size documents of 20 to 100 pages with fixed formats that can be stored as style sheets (formats for each type of page) and for a batch pagination approach, where the entire document is composed according to a set of predefined rules and commands.

Mid-range systems typically support low-resolution graphics because of the low-resolution (200 by 200 to 300 by 300 dot/in.) scanners and laser printers that they support.

Graphics most often must be fixed — that is, assigned to a specific area on the page — unlike high-end systems, which permit graphics to float

Life-sized COBOL

Sort 10,000 100-byte records in 43 seconds.

Load 10,000 100-byte keyed records in 36 seconds.

Compile a 10,000 line program in 76 seconds.

Search a 10,000 line source file in 16 seconds.

Hundred-line COBOL programs are common in benchmark tests. In real life, you deal in thousands of lines. So does REALIA.

REALIA is the fastest micro COBOL. It can handle the biggest files. But speed and capacity are only the basics. The compiler, GSA-certified at the high level, offers IBM VS COBOL compatibility and supports ANSI 85 features, such as inline PERFORM and END-IF.

COBOL programs can call DOS, C, and assembler subroutines, as well as accessing BIOS functions via the machine-level interface. The indexed file system handles multiple alternate indexes, with a maximum record

size of 32Kb. The interactive symbolic debugger works on your native generated code, instead of requiring an interpreted version. The full-screen editor imposes no limits on file size.

The programs you write are yours to distribute: REALIA charges no run-time or royalty fee.

REALIA gives you the tools you need for real-life development and maintenance projects. Fast, high-quality phone support. Automatic shipment of upgrades, free for the first year. An introduction to the independent REALIA User Group. A 30-day evaluation copy, for qualified companies. Call us.

Get Realistic about COBOL.

REALIATM
inc.

10 South Riverside Plaza
Chicago, Illinois 60606
(312) 346-0642
Telex 332979 REALIA INC.

\$995 includes the compiler, interactive symbolic debugger, editor, and a year of free upgrades and support. Visa / MasterCard / American Express accepted.

REALIATM COBOL requires MS-DOSTM 2.00 or above; an IBM PCTM PC-XTTM, PC-ATTM, 3270 PCTM, or compatible; and at least 160Kb of memory.

McLean and Peuto are the founders of Concord Consulting, a Menlo Park, Calif.-based consultancy that specializes in the computer-aided publishing industry.

Executive Report/In-House Publishing

along with text from page to page during the pagination process. Typography sophistication is usually limited to the capability of the laser printer.

Justification (right, left and center) is supported, accompanied by hyphenation based on a dictionary. Widow and orphan control is supported, as are running heads and footers. Some systems support automatic tables of contents.

As far as hardware is concerned, the distinction between high-end desktop systems and workstation systems is blurring now that personal computers are increasing in performance and workstations such as Sun Microsystems, Inc.'s recently released line are dropping in price.

The mid-range options include both of these desktop or workstation platforms. Enhanced PC AT Microsoft Corp. MS-DOS-based systems include Digital Composition Systems, Inc. and Corporate Data Sciences, Inc. offerings. Both provide bundled turnkey systems.

Basic system pricing for mid-range systems, including a workstation, laser printer and software, are as follows:

Corporate Data Sciences is currently the cheapest with its \$7,000 to \$13,000 price tags. Amgraf, Inc. offers a Unix-based system in the \$9,000 to \$16,000 range. NBI, Inc. provides its entry-level systems at \$13,000 to \$16,000. Digital Composition Systems bundles its system with a Datacopy Corp. scanner for \$23,000.

One can also buy a Sun Microsystems workstation or an IBM RT Personal Computer with Interleaf, Inc.'s Workstation Publishing Software for less than \$25,000.

Options for these mid-range systems include low-resolution scanners from vendors such as Dest Corp., with PC Scan (\$2,000); Microtek Labs, Inc., with MS-200 or MS-300 (\$2,500); and Datacopy, with Model 620 (\$14,950), Model 700 (\$3,940) or the just-introduced Jetreader, which sells for \$2,900.

Other options include laser printers from Hewlett-Packard Co., namely the Laserjet (\$4,000) and the Laserjet Plus (\$5,000), and Apple Computer, Inc.'s Laserwriter (\$6,000 to \$7,000).

Interfaces to computer-aided design systems like Autodesk, Inc.'s Autocad cost between \$2,500 and \$5,000, depending on which exchange format is to be used.

Typesetter interfaces cost between \$2,500 and \$6,000, depending on the typesetter and font requirements. Typesetters range from \$9,000 (Compugraphic Corp.) to \$30,000 (Linotype Co., Itek Corp. and AM International, Inc.'s Verityper).

High-end systems. At the high end, systems are not limited in performance and sophistication. They support long documents of hundreds of pages and usually require a Sun Microsystems-like bit-mapped workstation.

In addition, these systems typically offer both batch pagination and interactive page makeup, with features that include all those found in mid-range systems and additional ones such as vertical justification, side notes, straddle drawings and text, text runarounds, floating drawings and tables, automatic tables of contents and indexes, overflow

pages, automatic numbering of lists and section heads, annotations, change bars and listing of changed pages.

A few of these high-end systems are beginning to feature data base management facilities. These include products from Caddex Corp., which offers a Digital Equipment Corp.-based system for three users that costs \$100,000; Context Corp. (the offspring of Mentor Graphics Corp.), which sells an Apollo Computer, Inc.-based system with Apollo's Domain, serving up to 12 users (a three-user system costs around \$100,000); and Intergraph Corp., offering a DEC VAX-based system priced at a minimum of \$120,000.

All of these vendors have technical roots and are pursuing markets such as aerospace technical manuals.

These are the systems that are most likely to offer the automated changed-pages features so important to often-revised documents such as product manuals.

Others offering high-end systems that integrate graphics and offer typographic and pagination sophistication include the following companies: The Datalogics Corp. 6300 (\$140,000), The Eastman Kodak Co. Kodak Ektaprint Electronic Publishing System (\$35,000) and Interleaf's Technical Publishing Software system (\$30,000). These prices are for typical entry-level workstations, laser printers and software.

In addition, the following companies offer products in the price ranges listed: Penta Systems International, Inc. (\$50,000), Textet Corp. (\$55,000), Viewtech Corp. (\$50,000),

Xerox Corp. (\$90,000) and Xyvision, Inc. (\$60,000). Add-on workstations generally cost \$15,000 to \$50,000.

The options for these systems include all the laser printers listed above as well as high-resolution laser printers from Data Recording Systems, Inc. and Tegra, Inc., which sell for about \$35,000.

High-resolution scanners and scanning systems at the 1,000 by 1,000 dot/in. level are available from Imagitex, Inc. (\$25,000 to \$170,000), ECRM (\$50,000), Eikonix Corp. (\$35,000 to \$45,000), Compugraphic (\$60,000) and Autologic, Inc. (\$60,000 to \$150,000). Extremely sophisticated products are available from Information International Co. and Hell Graphics Systems, Inc. These products are priced between \$150,000 and \$250,000. ■

Introducing The Big KISS.

See us at
NCC Booth C3870.

Now QMS Gives You More Of A Good Thing.

When QMS introduced the KISS,TM it was the price breakthrough you were looking for.

Now QMS introduces the Big KISS.TM Giving you more power, more flexibility, more intelligence and more value than any other comparably priced competitive laser printer.

Big KISS gives you more fonts. Seventeen resident, plus additional fonts available via cartridge or diskette. More user/system memory at 640 K. More intelligence.



With Epson[®] FX80, QUME Sprint[®], Diablo[®] 630 emulations, and the powerful graphics capabilities of the ANSI X3.64 language. And with the Laser ControlTM software option, you can add seven additional emulations, including HP LaserJet.TM More interface flexibility. Enabling the Big KISS

to fit into virtually any computer environment (including UNIX[®] troff with the SmartSetTM software option)—PC, mini or mainframe. Plus eight-page-per-minute speed, quiet operation, and ease of use—just plug it in and it's ready to go.

Big KISS gives you more features you can use to meet your business needs. And you'll love the price—only \$2,995.

Once you've had a Big KISS, nothing else will satisfy you.

For more information and the name of your nearest dealer, call us toll free, 1-800-245-KISS (in Alabama, 205-633-4300, ext. 408 or 409.)

Epson is a registered trademark of Epson America, Inc.; Sprint is a registered trademark of QUME Corporation; Diablo is a registered trademark of Xerox Corporation; LaserJet is a trademark of Hewlett-Packard, Inc.; UNIX is a registered trademark of AT&T Bell Laboratories. © 1986 QMS[®] Inc.

- ☐ Send me more information about the Big KISS
- ☐ Send me the name of my nearest Big KISS dealer

Name _____

Title _____

Company _____

Address _____

City _____ State/Zip _____

Phone () _____

Type of system you are now using _____

Number of print workstations you are considering _____

Prime application for printer _____

QMS, Inc.
P.O. Box 81250, Mobile, AL 36689

QMS[®]

Print Systems With ImaginationTM

Continued from page 58

marketing, sales, engineering, investor relations, employee relations, technical publications, finance and others have a stake in the way in which documents are created and produced. Each may think it should control its own publishing projects, either by setting the standards in equipment and format that all others should follow or by disregarding what is going on in the rest of the company.

There is no formula for deciding who will take the lead in developing a coherent approach to computer-based publishing. But someone needs to coordinate corporate efforts, and MIS managers seem well suited to the task.

"They usually already have the prestige and power in the corporation and the necessary kind of budget, so they can make things happen more easily than people who manage other functions," says Xplor's Davidson.

Interconsult's Lewis backs him up. Where issues of data management, integration and new technologies are concerned, "MIS people are right smack dab in the middle of what's going on," Lewis says. "MIS is the logical choice for computer-based publishing because it's an integrating process."

Arlene Karsh, who directs the computer publishing systems market requirements service at C. A. Pesko Associates, Inc. in Marshfield, Mass., looks at the issue from another angle. According to her, MIS managers need to get involved "if they want to continue to be the czar of information handling."

"Especially where you have lots of central control and authority within the MIS area, it makes sense to get involved," she says. "It's going to come in through the back door, anyway."

The growing decentralization of document publishing is likely to put pressure on the MIS function in direct proportion to the amount of control the department has had in the past on how data looked coming into and going out of the corporate mainframe.

Whether MIS will be able to maintain control depends to a great degree on how well managers can overcome the traditional view of their abilities and attitudes.

Thomas Dunn, president of Dunn Technology, Inc. in Vista, Calif., and publisher of the "Dunn Report" on electronic publishing systems, is one who doubts that MIS can play a significant role in corporate publishing.

"The MIS guy has hardly ever been related to any product that somebody liked," Dunn says. "He has never given any consideration to the aesthetic quality of his data. How he's going to change all of a sudden, I haven't the foggiest idea."

Confronted with that argument, Davidson, whose organization's membership is drawn largely from MIS departments, replies, "I suppose that's a good point. But it's just as valid to say the print shop should stay out because of the programming involved, and the office manager ought to stay out because he doesn't know anything about either one. So nobody should do it."

"There isn't anybody prepared to do this," Davidson adds. "Traditional backgrounds and capabilities make no one qualified, and all of them have to be."

Desktop publishing: Easy, inexpensive

By RICHARD SHAFFER

Assembling an appropriate desktop publishing system requires finding three components — page composition software, a laser printer and a personal computer — and pulling them together.

Page composition software packages. These programs resemble word processing packages in that they let

Shaffer is editor and publisher of "Technologic Computer Letter," a weekly newsletter published by Technologic Partners of New York.

a user create and edit text, but they were designed primarily to make it easy to merge text and graphics on the computer screen. Text that has been created with word processing software can be combined electronically with artwork that has been generated with a drafting package or input with a scanner or digitizer.

The process requires no cutting, pasting, razor blades, wax machine or paste pot. Moreover, users can resize, scale and crop drawings and can format text and make it flow around artwork — all tricks that used to require the services of skilled graphics artists and typesetters.

Software packages fit into two

categories: those that run on the Apple Computer, Inc. Macintosh and those that run on IBM Personal Computers and compatibles.

The three most popular packages for the Macintosh are Macpublisher II from Boston Software Publishers, Inc. (\$195), Ready-Set-Go from Manhattan Graphics Corp. (\$195) and Pagemaker from Aldus Corp. (\$495).

On the IBM Personal Computer, the software choices are primarily Do-It from Studio Software Corp. (\$1,895) and Microsoft Word from Microsoft Corp. (\$195), but the selection keeps widening. T/Maker Co. just started shipping Personal Publisher, a \$195 program, and Xerox

THIS LAN IS THEIR LAN.



Anybody can network a handful of computers. But when you ask them to network a large company-full, they're likely to fall short.

That is, unless you ask Sytek.

You see, while everybody else has been talking about large-scale LANs, we've been building them.

In fact, the ones we've built to date have an average size of over 500 connections.

And we've built over a thousand of them. For a customer list that reads like "Who's Who" in business, government and education.

What's more, we can network just about anything.

With our System 3000/7000™ products, for example, we'll put all your IBM® 3270 and asynchronous ASCII equipment on speaking terms. Mainframes, minis, micros, the works.

Executive Report/In-House Publishing

Corp. will start marketing a \$695 program from Ventura Software, Inc. sometime down the road.

Software Publishing Corp., well known for its PFS series of personal computer software, is also coming out with a \$495 program, Superpage, which the firm is remarketing for Bestinfo, Inc.

Page composition software packages' capabilities vary widely. Microsoft Word, for example, will format text into columns, but the columns will not run side by side on the screen. And although the package can incorporate charts into the text, it cannot merge picture or line drawings. Do-It will accept line drawings but not digitized pictures.

Laser printers. The most important requirement for a printer is that it work with the composition soft-

ware the user wants to buy. Composition software works just fine with even a dot matrix printer, but this rudimentary configuration misses the point of elegant output. Most office users will want a laser printer.

Any laser printer will do desktop publishing, but some are more equal than others. A user's choice will depend primarily on the amount of line art or other graphics he wants.

At 300 dot/in. (the standard resolution of laser printers), a printer requires about 1M byte of memory to digitize an 8½-by 11-in. page. A laser printer with less than 1M byte of memory cannot print an arbitrary shape anywhere on the page.

The standard Hewlett-Packard Co. Laserjet, for example, supports full-resolution graphics, but only on a quarter of a page. The Laserjet Plus

supports full-page graphics, but only at a resolution of about 150 dot/in.

These capabilities make the Laserjet adequate for simple jobs, but more complex documents require an Apple-Laserwriter. The Laserwriter not only has more memory but also features greater microprocessing power than the Laserjet.

The standard HP Laserjet sells for about \$3,000; the high-end version costs about \$4,000. The Apple Laserwriter lists for \$5,999, but it can be acquired for about \$4,800. The Laserwriter Plus, which provides more type styles, costs \$800 more.

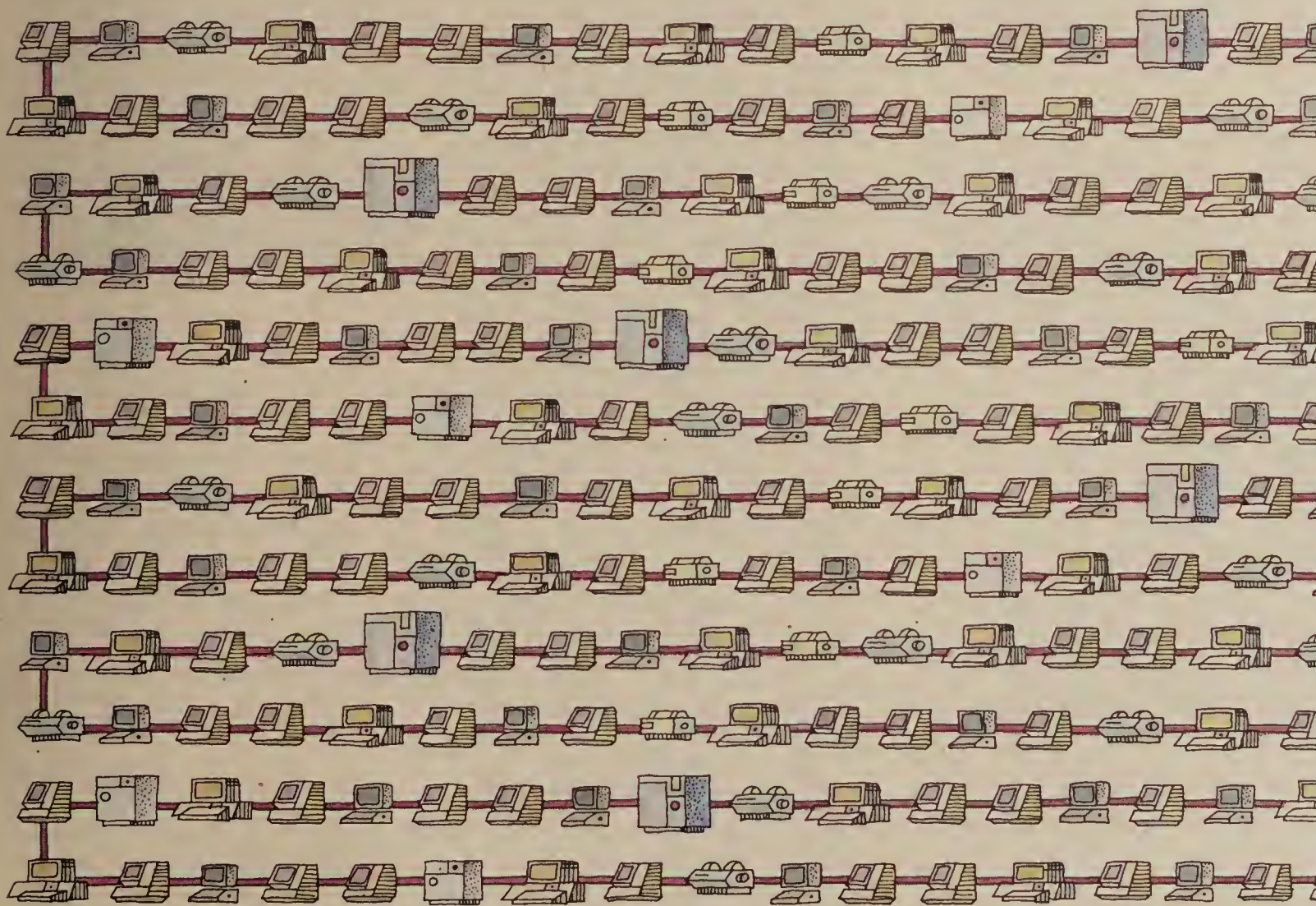
Personal computers. The Apple Macintosh features the well-known benefits of being easy to learn and use. In addition, what you see on the screen of the Macintosh is generally much closer to what you get out of

the printer compared with what is viewed on the screen of an IBM PC or compatible. But although the IBM PC is currently limited in its desktop publishing powers, it can drive the Apple Laserwriter.

If a company decides to go with Apple for desktop publishing, it may want to consider buying a Macintosh Plus rather than a basic Mac. Some composition programs work with a single-drive, 512K-byte machine, but for documents longer than a few pages, disk swapping gets to be an irritation.

Complex work requires a bigger machine. Any user department in which bills for typesetting, transparencies or other graphic arts services run above \$500 a month should be able to justify the price of a double-drive Macintosh Plus quite easily. ■

THIS LAN IS OUR LAN.



So you can access everything from a single terminal or workstation.

How large can we go? Well, many of our networks have 4000 to 8000 connections. And still have room to grow.

How far can we go? From building the hardware to planning, installation, customer training and on-going service and support.

So if you need a large-scale network,

you needn't settle for a small-scale supplier. Call us instead. Sytek, Inc., 1225 Charleston Road, Mountain View, CA 94043. (415) 966-7430.

And we'll show you a LAN of opportunity.

Sytek logo, System 3000 and System 7000 are trademarks of Sytek, Inc. Other computer and software names identified by ® or TM are trademarks and/or trademarks of their respective manufacturers. ©1986, Sytek, Inc.

Sytek See us at NCC

Beware of system shortcomings

The desktop publishing process seems so simple and appealing that a few caveats are in order, especially if one expects to gain corporate achievement rather than personal amusement.

First, to say that \$10,000 desktop publishing systems perform like \$100,000 commercial-grade publishing systems is to engage in the sort of hyperbole that has caused so many consumers to dismiss all claims about personal computers as so much malarkey.

Most desktop publishing systems resemble cheap guitars: Almost anyone can quickly learn to do something simple and pleasing with them, but making real music still takes talent. And, for the experts, the instruments are much too limited.

One shortcoming is that desktop publishing systems usually lack full-page displays. On most systems, the screen does not display the text as it actually will be printed.

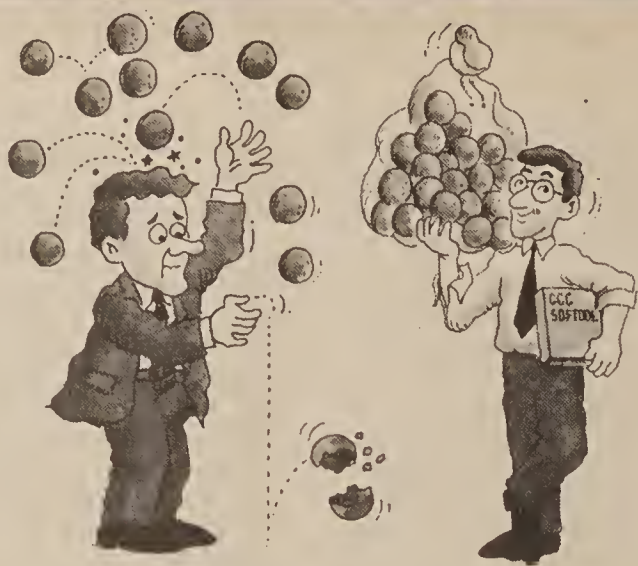
Moreover, some systems still require users to master tricky codes, and most still have a rudimentary networking capacity.

Compared with professional publishing systems, desktop versions are agonizingly slow. And they tend to permit only the most limited use of images from scanning machines. Layout can take hours, especially for beginners.

Also, electronic page layout will have the same double-edged effect on corporate users that computerization of the newsroom had on reporters and editors. Certainly, it will provide more control over the creative process, but it will also transfer low-paid clerical jobs (typesetting and proofreading, in the case of newspapers) to more highly paid, nonclerical workers.

Like word processing equipment, desktop publishing equipment will also permit — even encourage — professionals to spend a lot of time redoing their work and perfecting its appearance. One has to ask whether that is really an increase in productivity.

— RICHARD SHAFFER



Change Control vs. Change and Configuration Control... There is a *big* difference!

With Change and Configuration Control (CCC™) from Softool, you'll never drop the ball.

CCC is the Solution for the 80's:

While *change management* controls the changes to individual components within each version, *configuration management* controls complete versions and the relationship of their components to each other. With configuration management, all components of a given product can be organized, managed and tracked as a unit.

CCC Automates: management of changes and configurations • control over who makes what type of changes and where • tracking of trouble reports • reconstruction of previous versions • document control • management reports • archiving • and much more.

CCC is Interactive and Friendly:

It supports all programming languages, and comes with on-line tutorials.

CCC is a Proven Product: Over 1,500 Softool products are installed worldwide. CCC is supported on these computers: Apollo • DCL Ustation • DEC VAX • DG MV • Gould S.E.L. • Honeywell 6000 series (level 66, DPS 8/88) • HP 9000 • IBM 370, 30XX and 43XX • Sun Microsystems.

There is More: An integrated Programming Environment (PE™) is also available.

Call today for more details or a hands-on demonstration.



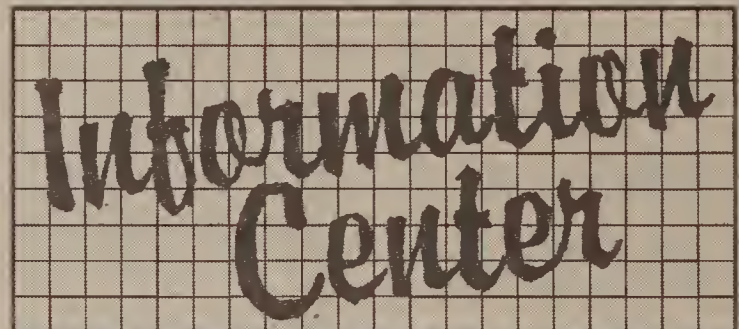
Softool Corporation

340 South Kellogg Avenue • Goleta, California 93117 • (805) 683-5777 • Telex: 658334

Proven in MIL-STD Applications!

Announcing

THE THIRD ANNUAL



CONFERENCE & EXPOSITION

**JULY 27-31, 1986
ANAHEIM, CA**

Join more than 1,500 colleagues at the event of the year for professionals who plan and manage end-user computing.

Here are some of the highlights:

- ☐ Full-day **WORKSHOPS** for in-depth coverage of specific topics
- ☐ Over 60 concurrent **SESSIONS** on all aspects of end-user computing
- ☐ Comprehensive **EXHIBITS** of the latest hardware, software, and services
- ☐ Plenty of **NETWORKING** opportunities to make important contacts
- ☐ Provocative **KEYNOTE ADDRESSES** open and close the conference
- ☐ And much, much more!

Call or write today for your copy of the 32-page conference brochure, complete with descriptions of all sessions, lists of exhibiting companies, and registration forms. Send the coupon to: Julia Stasio, Registrar, Information Center Conference, 38 Chauncy Street, Boston, MA 02111 or call her at: 617-542-0146

The Information Center Conference is sponsored by Information Center magazine.

Please send me the brochure on the Information Center Conference.

Name _____
Title _____ Organization _____
Address _____
City/State/Zip _____
Phone (____) _____

Executive Report/In-House Publishing

Survey

How to choose your first in-house publishing system

Users offer advice on getting started

By EDDY GOLDBERG

The purchase of an in-house electronic publishing system can be likened to the purchase of any other computer system — with one major difference. The comparative newness of publishing systems has left potential buyers confused.

Advice from current users who have implemented electronic publishing solutions — ranging from desktop to mainframe — can help those considering a system.

• **Define your needs.** Publishing requirements vary greatly from one company to the next. Where an Apple Computer, Inc. Macintosh may be more than adequate for one company, an IBM mainframe may be needed in another.

Who reads the output will determine whether a 300 dot/in. laser printer or a four-color press producing typeset-quality documents is appropriate. The level of computer expertise, ranging from highly trained DP personnel to writers who refuse to learn format codes and commands, determines what kind of front end the system should have.

• **Consider a mainframe solution.** When considering automating the publishing function, Pete Murphy, second vice-president in the DP department at the Travelers Insurance Co. in Hartford, Conn., recommends looking at the "big picture."

At Travelers, the vast store of data used in printing insurance policies resides on the company's mainframe. Not counting field offices, Murphy estimates that about 20 million pages a month fly off eight IBM 3800 laser printers, each of which puts out 215 pages every minute.

"It's very natural to meld the two technologies of DP and printing," he says. "With 300 million instructions per second of computer power in the data center, it would be foolish for us to go down separate paths."

Murphy says that although both the cost and associated risk of buying a desktop-based publishing system are small, so is the return.

"There are a lot of companies like us," he says. "With large volumes of publishing, the payoff is greater with a larger capital investment. The place you have the big payoff is where the printing and data processing are compatible."

• **Use multiple solutions.** According to Vijay Mohan, manager of electronic publishing at J. C. Penney Communications, Inc. in New York, desktop publishing systems can complement conventional installed systems.

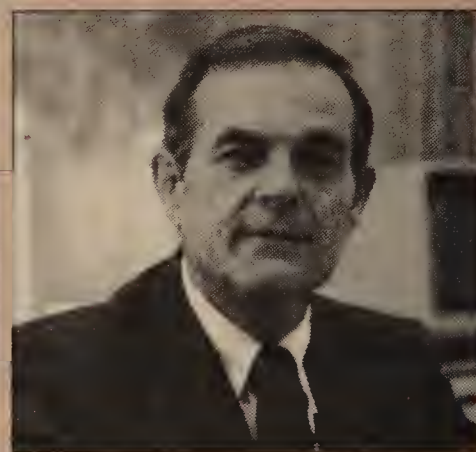
"We have both conventional pho-

totypesetting capability and in-house laser output," he says. "My reason for getting the desktop publishing system is that it complements, not substitutes for, typesetting."

Mohan's operation uses Eastman Kodak Co.'s Kodak Ektaprint Electronic Publishing System (KEEPS) for internal documentation that includes manuals, forms and bulletins.

For work requiring phototypeset output, he has a separate Atex, Inc. system. Keyboarding, editing and page composition is done in-house, but the phototypesetting output is performed by off-site vendors via 9.6K bit/sec. modems. "The desktop system is not for refined work," he says.

• **Involve everybody.** Bringing in as many people as possible throughout the decision-making process is



”

'Make sure everybody in the organization who has any influence sees the product. Start with the users, who tell their bosses, until it gets to the top.'

— David Becker
Boeing Aerospace Co.

critical, says David Becker, automation manager for Boeing Aerospace Co.'s Graphics Electronics Publishing Project. During an exhaustive examination of publishing needs undertaken about three years ago at the Seattle company, user input and technical expertise provided by Boeing Computer Services Co. played a key role in the adoption of a new system.

Becker coordinated the search and arranged for the demonstration in early 1984 of an early version of Interleaf, Inc.'s workstation-based publishing software, once he determined the product had potential for Boeing Aerospace's 230 graphic artists. Although he encountered some internal resistance to dealing with a small start-up company with a new

Goldberg is a Computerworld senior writer.

Executive Report/In-House Publishing

product and an uncertain future, the demonstration was a key factor in selling the system inside Boeing.

"Make sure everybody in the organization who has any influence sees the product. Start with the users, who tell their bosses, until it gets to the top," he suggests. Becker adds that it helped a great deal when the president of Boeing saw and liked the Interleaf system.

• **Solicit user input.** Bob DeFord, manager of technical documentation at John Fluke Manufacturing Co. in Everett, Wash., is the first customer for the technical publishing system offered by Caddex Corp. of Woodinville, Wash. He underscored the value of involving the users in the purchasing decision. "It's important to work with your people. A lot of the success or failure with an automated publishing system comes from involving them."

DeFord claims that managers do not always attempt to understand the user's viewpoint or look at the impact that these systems will have on departmental culture. "Most managers ignore this and get hit

• **Fit the system to the users.**

Johnson also wanted a system that was responsive to nontechnical users. "Ease of use by the operators translates into productivity," he says. "I wanted a software program that would insulate the people from whatever the machine was doing. Non-computer types tend to be less forgiving. They won't understand why a machine is slow and will lose interest if a machine is not responsive."

• **Don't overbuy.** Michael Bosniak, manager of reprographics at NBC in New York, cautions against buying systems that are too sophisticated for typical corporate users.

"Some systems are quite sophisticated and could solve every one of our needs. Unfortunately, they are designed for heavy production. It's possible that these systems are too sophisticated and too costly for the in-plant or corporate market," Bosniak warns.

After testing a number of solutions, Bosniak decided to use a Compugraphic Corp. Powerview 8600 system for high-quality text output and a Kodak KEEPS system for graphic output that includes charts and graphs. He plans to hook the Compugraphic and Kodak systems together in the future.

• **Choose open architectures.** Choosing a single vendor with a dedicated proprietary system may not only inhibit multivendor connectivity but may prevent a company from taking advantage of a still-evolving technology, says Boeing Aerospace's Becker.

"In other words," he adds, "favor open architecture implementations that adhere to or that are compatible with de facto, industrial, national and international standards."

• **Investigate start-ups before you invest.** Although most users recommend going with an established company that has a proven product, there can be advantages to getting involved with a smaller company still developing its product. In short, you get a bigger vote.

If you do bet your money, and perhaps your job, on a small, promising company, be sure to thoroughly investigate its management and financing. Above all, visit and talk to its users.

In late 1983, David Tamminen, manager of printing services at Union Mutual Life Insurance Co. in Portland, Maine, was one of the first customers of Xyvision, Inc. of Wakefield, Mass. "I went with a new company at its beginning, instead of an older product at the end of its development cycle," he reflects.

• **Don't neglect service and support.** The assurance of prompt, reliable service is a key factor in choosing a system, especially when dealing with a new technology. For Tamminen, whose company is located in the northeast corner of the country, simply finding someone willing to come up and service his system immediately eliminated many vendors.

Telephone support also can be helpful. Kodak, for instance, offers an on-line diagnostics system that can come in handy when a piece of equipment breaks down. ■



”

'Prospective users should keep in mind that anything with less than a 32-bit CPU won't be fast enough for serious electronic publishing.'

— Norton Johnson
Micro Component Technology, Inc.

with it later."

• **Be clear about performance requirements.** For Norton Johnson, communications supervisor at Micro Component Technology, Inc. in St. Paul, Minn., the key factor in choosing a system was performance. Johnson is an early user of Interleaf's Technical Publishing Software running on Sun Microsystems, Inc. workstations.

One key factor for Johnson in considering different systems is the size of the documents they will handle comfortably. "Anything with less than a 32-bit CPU won't be fast enough for serious electronic publishing," he says. Also, "having a CPU available for each machine means that adding users does not degrade performance," he adds.

PRICELESS

Our fluent and fertile fourth generation language, MITROL is a masterpiece of work. Add to it our proven implementation methodology called PREP (PROTOTYPE and Define, REFORMULATE and Design, EVOLVE and Develop, PILOT and Implement) and you have a priceless combination that helps you think before you act—sketch before you paint.

For more information about MITROL, PREP and our entire gallery of business solutions—software products, educational products and consulting services, call us.

Mitrol.

The Fine Art of Information Management.

Mitrol Inc., World Headquarters, 800 Cummings Pk, Woburn, MA 01801 (617) 933-9545
Mitrol Incorporated in partnership with Teamco Systems Innovation headquartered in Holland 31.3465.71544

IRMATM. KLONETM.

\$595.

FREE TRIAL.

100% IRMA COMPATIBLE. MADE IN USA.

KLONE is a low cost, generic replacement for Irma, the micro to mainframe link for IBM 3270 users. KLONE includes **all hardware and full emulation software**. Any and all programs that support Irma will support KLONE. Configured and programmed from floppy disk, KLONE allows enhancements and upgrades without changing ROMs or disassembling the PC. KLONE is manufactured and backed by Agile, a company with over 8 years experience in IBM product emulation.

30 DAY FREE TRIAL.

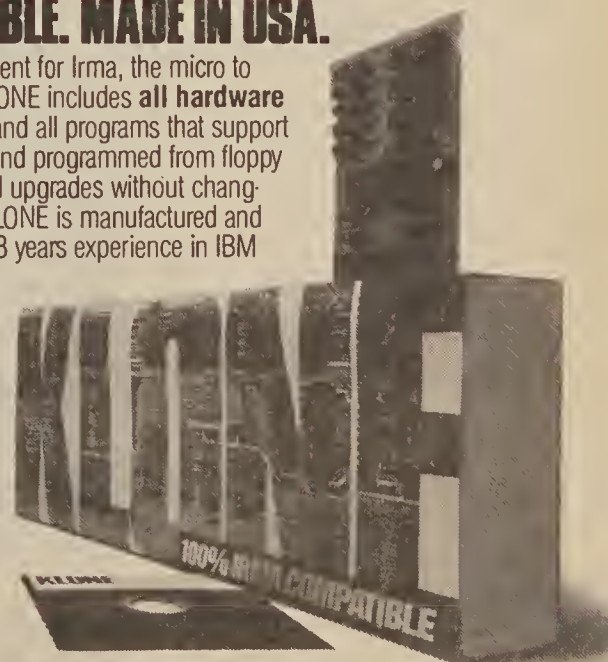
KLONE is being offered to you at no risk. If after 30 days use you are not 100% satisfied with KLONE's performance, you may return it at no charge. Call now for info.

800-538-1634

(Inside CA, call collect 415-825-9220)

AGILE

4041 Pike Lane, Concord, CA 94520



Irma is a trademark of Digital Communications Associates, Inc.
KLONE is a trademark of AGILE

Can your on-line transaction processor do anything else?

A lot of on-line transaction processors just can't cut it if you need them to do other kinds of processing.

Oh, they can do some of your general purpose processing work when push comes to shove.

But not easily, and not efficiently.

That's where we come in.

The NCR 9800 was built to be an excellent on-line transaction processor, as well as an excellent general purpose processor.

How?

Using what we call job-specific modules.

The 9800's architecture lets you configure the right processors to do the job: either application processors or data storage processors.

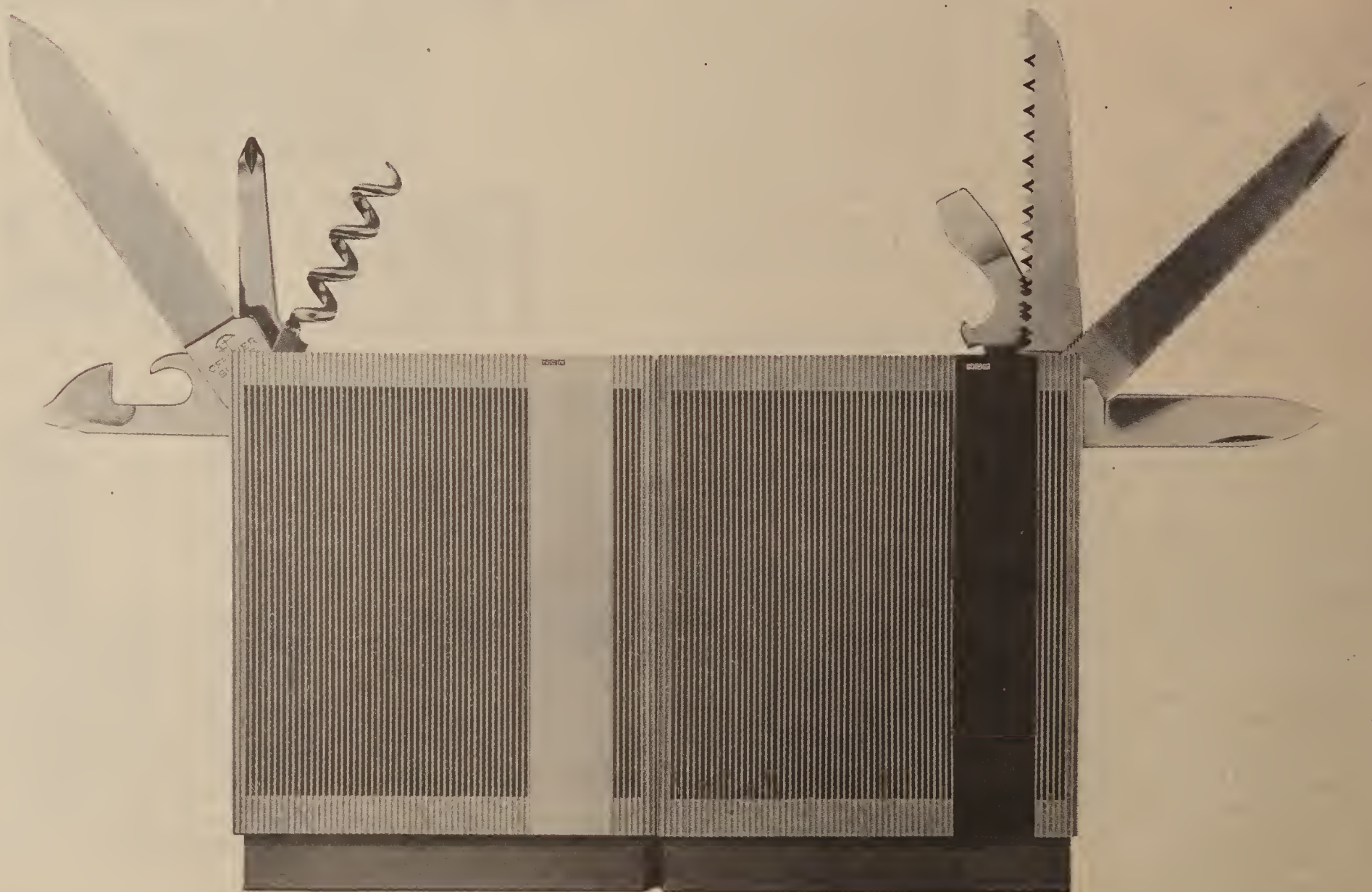
So it can do both jobs — transaction and general purpose processing — more efficiently.

And that leaves just one job for you.

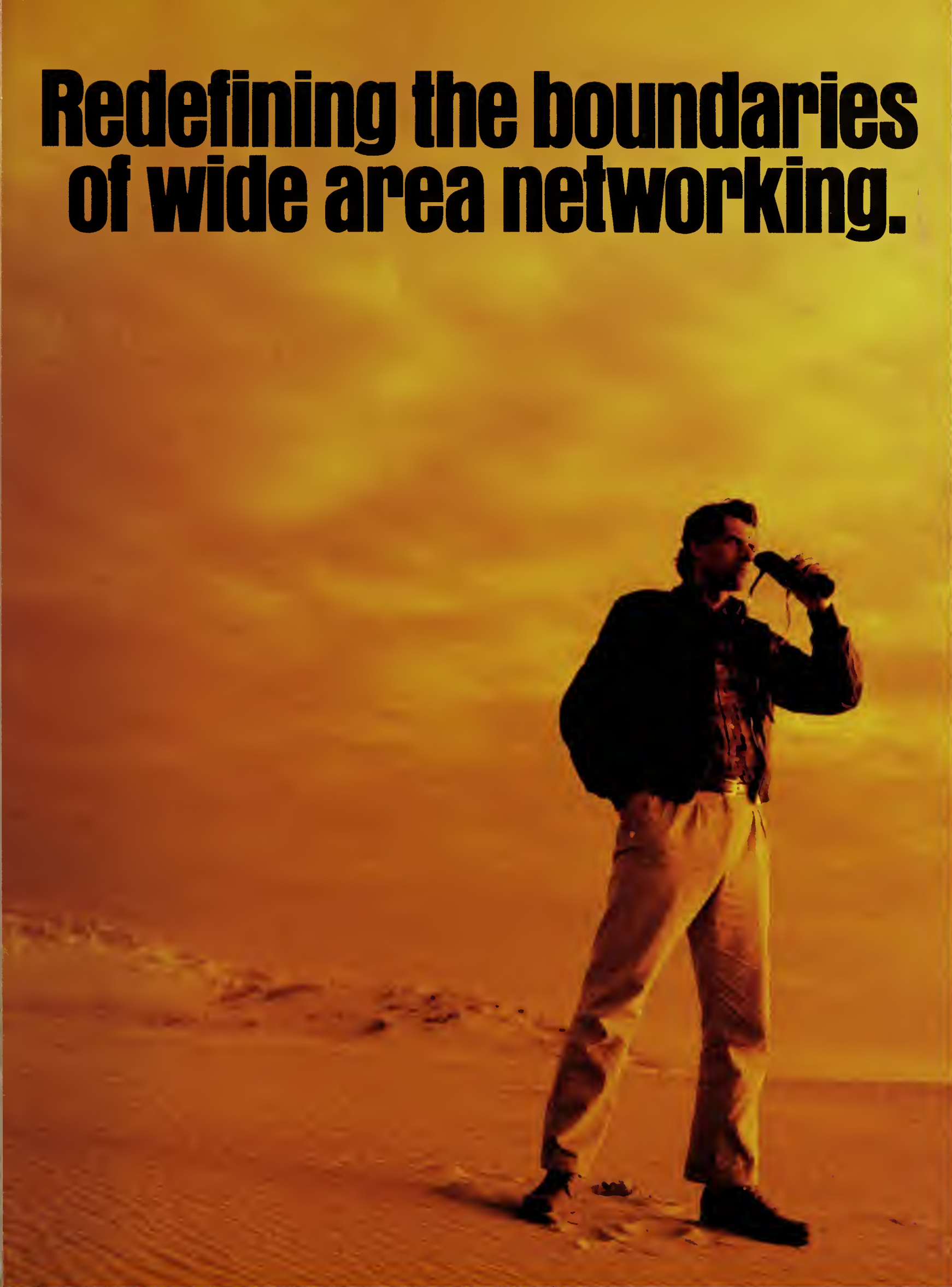
Calling us. We're at 1-800-CALL-NCR.

NCR 9800. The evolution of the mainframe.

NCR



**Redefining the boundaries
of wide area networking.**



There are no boundaries.

For all the benefits of business growth, there are just as many potential pitfalls. Especially when it comes to your communications network.

Adding network locations across town or across the country means having to pull together more types of equipment. While added transmission lines can mean out-of-this-world monthly bills.

You need viable options.

That's why you need Codex.

How to get where you're going.

For just about any type of network problem, we have the solution. Because Codex offers the most complete range of networking products available. In fact, we've just introduced a whole new set of high-end multiplexers and gateways that let you custom-tailor a network to go farther than ever before, in terms of traffic volume, performance and growth.

The Codex 6200 Series Digital Transmission Multiplexers, for example, let you take advantage of the large bandwidth capacity of digital facilities and their falling tariffs at the same time. One product allows you to combine voice and data in a single network using T-1 circuits. The other offers expanded network configuration flexibility and the highest price/performance in its class.

Another option is the Codex 6700 Series Network Processors. They're our next generation of statistical multiplexers that provide the most sophisticated automatic routing and rerouting features around. Plus offer improved throughput efficiency and extensive mixed protocol support to integrate a variety of applications in a single private network. There's even one model that provides access to popular packet switched networks.

Then there are the Codex SNA Gateways. They allow you to integrate async and bisync devices in an SNA network, and distribute IBM's Communications Network Management capabilities throughout.

Altogether, it's a range of new networking solutions that employs the latest, most advanced microprocessor technology. To maximize line efficiency, improve throughput, optimize system availability and reduce network costs. And allow you to custom-tailor your communications network, again and again, to get the best possible performance. Today and in the future.

In short, Codex high-end multiplexers and gateways are products that can help your business get where it's going.

It grows on you.

What makes this new group of Codex products so special are their individual capabilities, like extensive SDLC/HDLC and BSC protocol support for widespread equipment compatibility.

Support for high speed digital circuits, at T-1 and 56 kbps/64 kbps speeds. Automatic bandwidth allocation and adaptive data compression to maximize line efficiency. Selectable transmission rates for added flexibility. Switching capabilities and access to X.25 public networks. And protocol intervention to minimize delays associated with long-distance, satellite transmissions.

NEW NETWORK SOLUTIONS FROM CODEX

T-1 Multiplexer with enhanced voice and data capabilities

Digital Transmission Multiplexer for medium speed applications

Data Service and Channel Service Units for DDS use

Networking Multiplexers for high throughput, mixed protocol environments

Gateways that provide connections to IBM SNA and X.25 networks

Collectively, they share system features that will keep your network running strong for a long time to come. Including software-based configurability,

centralized control, automatic redundancy, modularity and transparent operation. All the elements you need to join multiple networks together to form one cohesive, high-performance solution.

It doesn't end there.

Not only does Codex offer the widest range of vendor-independent networking products—including over 200 different modems, network management systems, and local area networks—we are the networking specialist most preferred among datacomm and data processing managers alike. With award-winning technical service, expert application engineering and unmatched product quality. Which is why 90% of the FORTUNE 100 have placed their confidence in Codex.

So if you're at a point where you should explore wide area networking a little further, explore Codex.

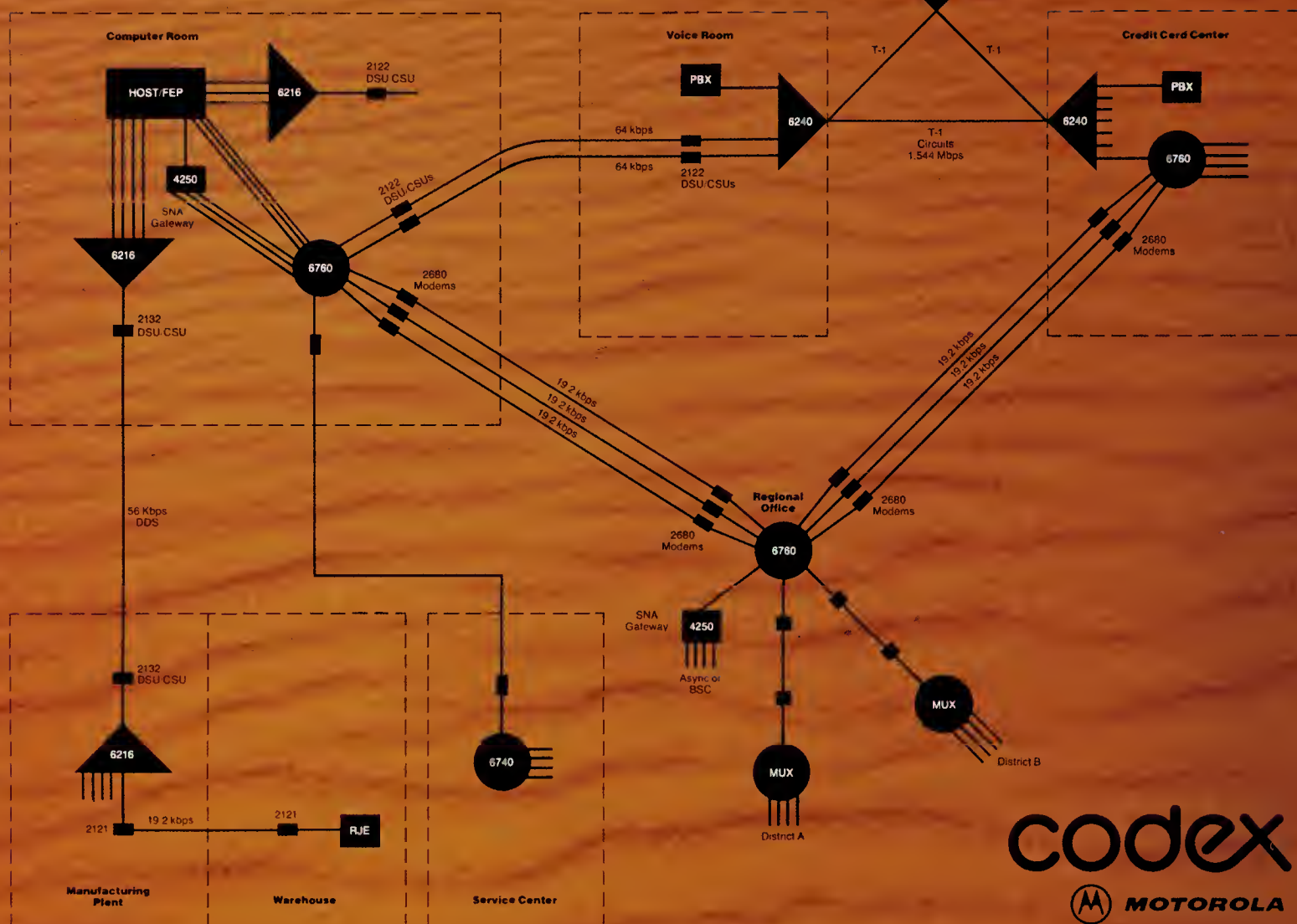
Because to our way of thinking, how far your network takes you should be as far as you decide you want to go.

For more information, call us at 1-800-426-1212, ext. 244. Or write Codex Corporation, 20 Cabot Blvd., Dept. 707-44, Mansfield, MA 02048.

codex
 **MOTOROLA**



If you're ready to broaden your networking horizons, we're ready to show you just how far you can go. From one point of departure. Codex. Call 1-800-426-1212, ext. 244 for more information.



codex
MOTOROLA

Codex 6240 Digital Multiplexer

- Combines up to 96 voice, synchronous data and video channels—in any mix—over high speed T-1 circuits for dramatic cost savings.
- Transmits at aggregate link rates up to 2.048 Mbps.
- Provides "toll" quality for voice transmission with ADPCM voice modules.
- Allows channels to be dynamically allocated and automatically reconfigured from an operator terminal.
- Adds networking flexibility for point-to-point and multipoint applications.
- Ensures maximum system uptime with automatically redundant components.

Codex 6216 Digital Multiplexer

- Combines up to 16 asynchronous and synchronous data channels over high speed DDS circuits for dramatic cost savings.
- Offers selectable aggregate transmission rates from 48 kbps to 80 kbps.
- Requires minimal bandwidth overhead resulting in greater link efficiency.
- Provides single site network management with complete software control and up to four programmable configurations.
- Ensures maximum system uptime with automatically-switched redundant hardware.
- Acts as a combination multiplexer/switch by routing channels to different destinations.

Codex 6760 Distributed Communications Processor

- Delivers 40,000 characters per second of continuous asynchronous, bisynchronous and SDLC/HDLC throughput with adaptive data compression.
- Accepts 256 simultaneous calls for large-scale communications.
- Transmits at aggregate link rates up to 64 kbps.
- Supports four group band trunks or sixteen 19.2 kbps links.
- Adds flexibility to expand from point-to-point applications to multipoint applications with as many as 127 full networking nodes.
- Offers central site network control and testing with downline loadable software.
- Provides access to public packet switching networks with an X.25 Level 3 interface.
- Ensures maximum network uptime with automatic rerouting and transparently redundant hardware.

Codex 6740 Distributed Communications Processor

- Supports statistical multiplexing of asynchronous, bisynchronous and SDLC/HDLC protocols concurrently.
- Simplifies networks with async switching/contention package.
- Supports up to 64 terminals per node for medium size networks, including

- two wideband links at 64 kbps or eight 9.6 kbps links.
- Provides flexible support for point-to-point applications as well as full networking for three nodes.
- Provides central site network control and testing with downline loadable software and remote datascopes capability.
- Ensures maximum uptime with optional automatic redundancy for master logic and power supply.
- Extends the advantages of networking to small configurations with prices starting at \$6000.

Codex SNA Gateway

- Eliminates parallel networks by providing widespread access to SNA applications by asynchronous and BSC devices concurrently.
- Lowers operating costs substantially by eliminating unnecessary Front End Processor software, frees up communications ports and preserves investments in non-SNA devices.
- Extends SNA's Communications Network Management capabilities to non-SNA devices by responding to NPDA commands.
- Insures against obsolescence with software design and allows for user-programmable application flexibility.
- Supports direct, leased and dial-up connections for central and remote sites.

In Depth

Building a better project manager

The question is not whether a project manager development program is affordable but rather whether MIS can afford not to have a source of excellent project managers.

By DIANA BANDER

For the MIS organization, project success creates real dollar impact, and the project manager drives that success. But top-performing project managers are hard to find. Most MIS directors and vice-presidents, when asked for the number of high-performing project managers in their own shops whom they could trust with a high-leverage project, came up with one, maybe two names.

What makes these project managers superior? More important, how can MIS/DP organizations systematically reproduce this precious talent so the systems operation can confidently handle the increasing number of large development efforts that have such dramatic impact on the corporation's bottom line?

The good news is that you can develop them. You can cultivate your own cadre of excellent project managers who can be deployed when and where needed to manage the design, development and installation of software systems throughout your organization.

The best news is that you can do this in-house. When trained within the

corporate structure, project managers will develop according to a validated model of outstanding performance and will reflect the organization's norms, culture and standards. They also will gain an in-depth understanding of your business and the internal tools and methodologies that form the fabric of your information systems organization.

Job competency analysis

Industrywide, intensive qualitative investigation into the behavior of the outstanding project managers has yielded data that defines the distinct roles, functions and critical competencies that are demonstrated by superior software project managers and that are necessary to develop average and potential performers for that job. Assembled into a behavioral model, the data reveals both the fundamental functions of the project manager's job in the MIS environment and specific competencies that drive outstanding performance of these functions.

This behavioral research process, called job competency analysis, differentiates the basic behaviors — the job functions — that actually define that particular job and make it different from any other job from the specific behaviors — those that drive the outstanding execution of the functions — that exemplary performers bring to the job. These behaviors that result in superior performance are called competencies.

The results of the analysis reveal five basic functions of the MIS project manager:

- Planning.
- Managing tasks.
- Managing the project team.
- Interfacing with the user.
- Interfacing with the rest of the organization.

These five functions must, by definition, be performed in order for the project manager job to exist. They become a performance standard against which the person in the target position is measured.

Planning involves analyzing the technical and environmental aspects of a project for its human resource, cost, time and schedule needs. The sub-tasks in this function rely on standard planning techniques that many project management software packages offer.

Managing tasks includes maintaining a project overview and control book, tracking changes and conducting audits and walk-throughs. Essentially, this function requires the application of all behaviors involving technical

Bander is manager of project manager services at Keane, Inc. in Boston.

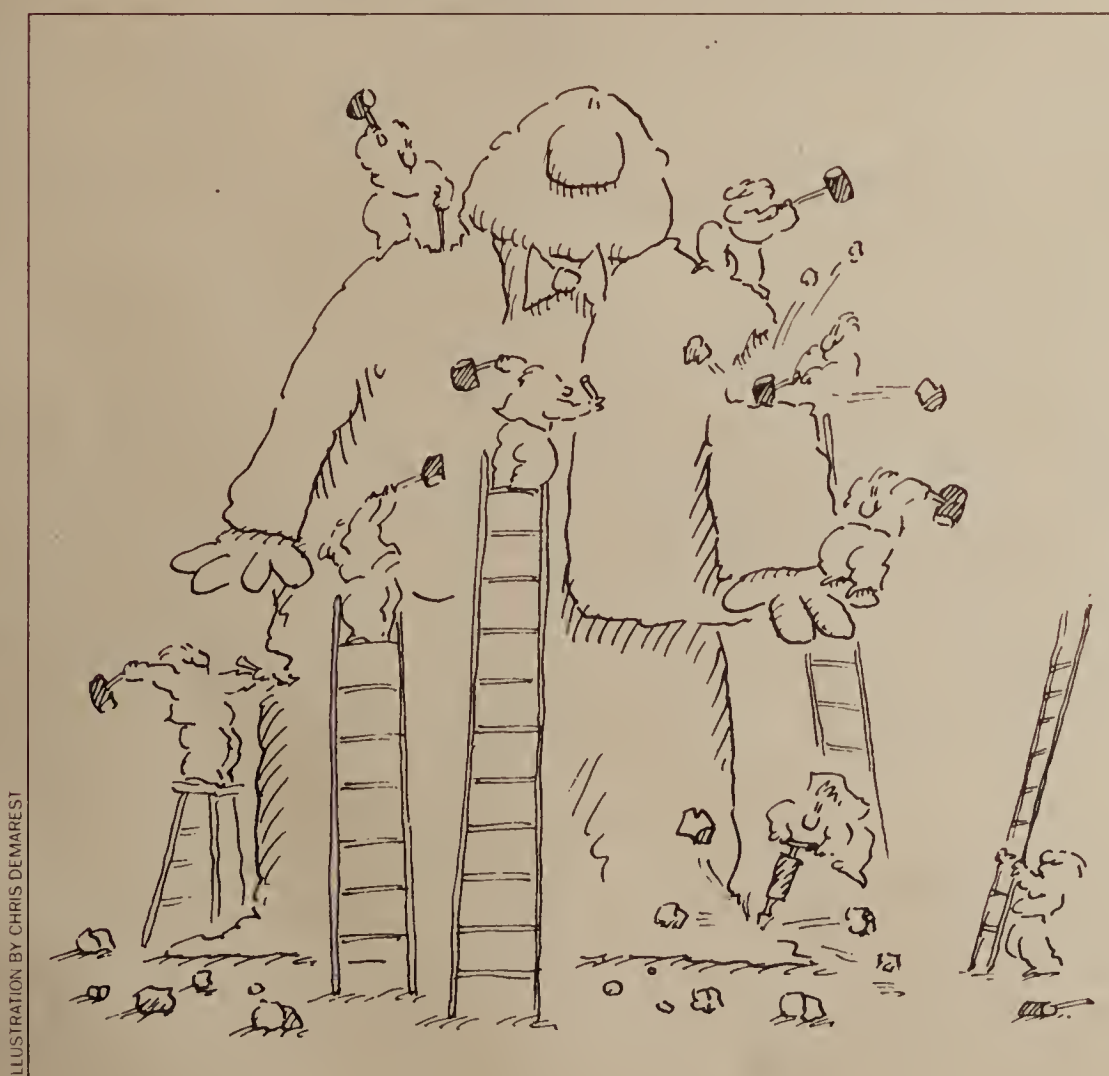


ILLUSTRATION BY CHRIS DEMAREST

In Depth/Building a Better Project Manager

knowledge and control techniques. Again, software packages and typical project management seminars focus on this and the planning function.

Managing the project team moves more heavily into the people side of project management and requires that the project manager orient, motivate and deliberately develop the project team as well as provide continuous feedback and communication to them.

Interfacing with the client, or user, recognizes the absolute need to be involved with and responsive to the part of the organization "buying" the system — that is, the user, or client, for whom the MIS organization is developing the system. This client involvement and responsiveness manifests itself throughout all project phases from definition to de-

sign and ultimately to user takeover of the system.

Interfacing with the organization focuses on the project manager's relationship with the rest of the company. It involves negotiating for staff and resources as well as continuing to build the DP function within the corporation.

In the job competency model, each function is precisely broken down into subtasks so that the functions are behaviorally defined. This allows an organization to look diagnostically at the project management function and determine if, in practice, these fundamental functions are being executed; determine who is performing them — systems; the user or both — and how well they are being done; and, very critically, determine functions that are not being done.

By isolating and defining these

behavioral functions, the MIS organization can impose a more precise structure and standard on its project management environment and identify where and by whom these essential behaviors are being executed.

Competencies

The second half of the project manager model identifies the qualities and attributes that characterize the superior performer. Called competencies, these behaviors are organized into clusters that have a dominant theme or focus (see chart below). Some of these competencies must be uncovered in the hiring process; others are developed through coaching, on-the-job training experiences and professional development programs.

Regardless of a company's size, industry, DP shop size or structural

relationship with users, outstanding project managers bring four major behavioral skills to their job function:

- Problem solving.
- Managerial identity.
- Achievement orientation.
- Strong influence.

These skills, used more often and more completely to achieve better results, are the hallmarks of the excellent project manager.

These behavioral competencies are striking because they confirm what most MIS vice-presidents intuitively know — that the superior project manager is more than a master at cookbook techniques and methods and that program evaluation and review, critical path management and other project control techniques are necessary but far from sufficient for excellence.

The MIS world gravitates all too easily toward tasks and functions. Superior performance arises from prerequisite behavior that develops from an important combination of focused and deliberate managerial coaching, on-the-job experience and ongoing training.

Problem solving

Perhaps the single most important and most frequently displayed competency DP project managers exhibit is their ability to solve problems. This is demonstrated by skill in logically analyzing information and identifying patterns from which conclusions may be drawn.

Problem-solving behaviors require project managers to go through the same mental steps they use in the systems development process:

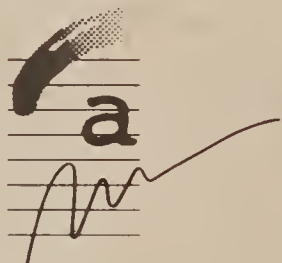
- Study and diagnose project-relevant activities, problems, concepts or alternatives and accurately define them.
- Apply systematic thought processes to break larger parts into manageable pieces.
- Apply creative and conceptual

IS THE ~~PUBLISHED~~ WORD COSTING YOUR COMPANY TOO MUCH?

Corporate Electronic Publishing Systems (CEPS) is a new approach to an old problem. It's a fully-automated method of producing all types of documents in-house — from simple memos and proposals to technical manuals and four-color marketing brochures. And CEPS technology lets you do it in a fraction of the time — at a fraction of the cost.

Companies just like yours are already getting returns of up to 60% on their CEPS investments!

Corporate
Electronic
Publishing
Systems™ IV:



A Conference and Show

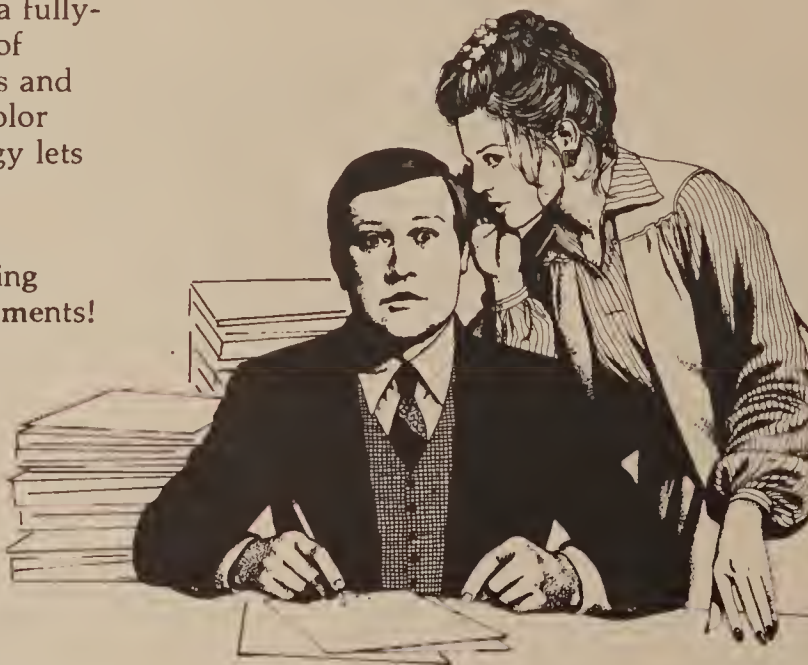
Featuring Desktop, Workstation
And Dedicated Publishing

September 9-11, 1986. World Trade Center.
Boston, Mass.

The CEPS™ IV Conference
and Show features:

- Presentations by industry experts
- Actual case studies from successful CEPS users
- One-stop shopping
- Hands-on demonstrations from leading vendors like Apple, Interleaf, Kodak, Xerox, Xyvision, MORE!
- "Desktop Village", a section of the show floor devoted exclusively to desktop publishing and its applications

You'll learn how desktop, workstation and dedicated publishing products can help you save time, cut costs and become more productive and profitable!



"What's a 'CEPS'?"

Don't Delay!

Call (203) 964-8287, or mail this coupon for complete Conference Program details. Act today — special early-bird prices apply if you pre-register before **August 15, 1986.**

CEPS™ IV		
P. O. Box 597 Chester, NY 10918		
☐ Please send me full details on the Conference Program.		
Name	Title	
Company		
Address		
City	State	Zip
Telephone		
☐ My company may want to exhibit, please send details.		
B		

Project manager competency model

Problem-Solving Cluster

- Diagnostic thinking
- Systematic thinking
- Conceptual thinking
- Monitoring and information gathering

Managerial Identity Cluster

- Strong project manager identity
- Self-confidence
- Flexibility

Achievement Cluster

- Concern for achievement
- Results orientation
- Initiative
- Business orientation

Influence Cluster

- Organizational and interpersonal astuteness
- Skillful use of influence strategies
- Team building
- Team member development
- Client or user orientation
- Self-control

Information provided by Keane, Inc.

Four areas of competency distinguish the excellent project manager, according to nationwide interviews conducted by Keane, Inc. over the past two years with project managers and MIS directors and vice-presidents.

We don't make an exceptional number of mainframe software products.



Just a number of exceptional ones.

GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
CAPITAL PROJECT MANAGEMENT

consistent throughout our line of financial software. We believe that quality, reliability and integration shouldn't be *optional features* of a software system. They should be built in from the ground up.

Since 1973, hundreds of FORTUNE 1000 companies have reaped exceptional results from our systems: Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank; The

New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more all choose Data Design over other vendors.

In fact, we'll even send you our *entire* customer list. Ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions and more.

If you're in the market for mainframe financial software, we want you to consider the products that are considered the best: financial applications software by Data Design.

The choice is yours: the biggest or the best. Learn more about the best financial software available. Call Betty Fulton toll-free at 800-556-5511.



**DATA DESIGN
ASSOCIATES**

Excellence in financial software. By design.

1279 Oakmead Parkway, Sunnyvale, CA 94086

Some large software companies aggressively sell the single vendor idea. Unfortunately, the benefits of using this approach can be far outweighed by inconsistent quality and poor integration across a multi-application product line. Opting for one vendor may force a user to settle for some second-class products that ride on the coattails of good ones.

Unlike many "single source" or "all-things-to-all-people" vendors, Data Design believes in doing one thing. And doing it well. We specialize in truly integrated mainframe financial software. Period.

Data Design is the only major mainframe software vendor that keeps this focus and resists the attraction of a vastly expanded product line. By writing every line of code, we can assure that Data Design systems are crafted to our own strict standards. By developing each application from scratch, using the same proven approach, we can achieve the level of compatibility that defines integration. By subjecting each system to Data Design's rigorous testing program, we can offer products with an extremely high level of quality,

In Depth/Building a Better Project Manager

solutions to problems.

- Monitor and evaluate results.

For example, competency in diagnostic thinking was shown by one project manager who told the user that she "would not embark upon designing a system that neither of us really understood" and withstood management pressure to begin coding prematurely.

Another project manager in a manufacturing organization used diagnostic thinking when he realized that a study on upgrading a production process had focused on nonessential issues, while the key problem was the organization's reluctance to budget for and select a vendor for new equipment.

Systematic thinking was demonstrated by the project manager who, with his boss, reviewed all the levels of the division they would have to deal with concerning different aspects of gaining approval for new equipment.

Another project manager, when asked to release a particular employee from a project, convinced his manager to think through the cost to the project, the effect on other team members and so on.

The problem-solving cluster essentially links those methods and strategies of considering, analyzing and gathering information that are critical not only at the early stages of a project but also throughout the project life cycle.

It is the impetus behind the outstanding performance of the planning and task-managing functions of the project manager's job.

Managerial identity

As project managers expand their professional experience and move into different project phases, different skills and competencies demand development. Less emphasis may be placed on basic problem solving and more on requirements to demonstrate managerial behavior.

Collectively, these competencies are referred to as the managerial identity. They are principally demonstrated by the following characteristics:

- A strong project manager identity — "I am in charge."
- Confidence in one's own ability and judgment.
- A high level of flexibility that permits consistent allowances for alternative approaches.

One manager exhibited strong project manager identity by staying out of individual contributor-type tasks. He saw his role as ensuring that the client's needs were satisfied and that he was on schedule.

Another manager exerted managerial identity when he realized that he had been unwittingly drawn into an indi-

vidual contributor role and steered himself back onto the critical path.

One critical competency in the managerial identity cluster is flexibility.

For example, a project manager found that the user would not sign off on large pieces of the project. Instead he submitted for consideration small pieces that took less of the user's time to review and were also easier to maneuver through the budget approval process.

Flexibility also manifests itself in the project manager's ability to apply different managerial styles according to the needs of various team members.

Take, for example, the project manager who wanted to convince his team to use structured design. He spent time explaining its history and rationale to one team member who wanted that level of detail.

However, by contrast, he merely demonstrated how to

use structured design techniques to another team member who preferred simply to be told what to do.

The managerial identity cluster contains competencies that sit at the core of a superior project manager's self-concept. These competencies have a strong impact on the managing project team and client and organizational functions interfaces.

When necessary and appropriate, effective project managers assert their au-

thority and control with confidence and are flexible in their approach.

Achievement

Successfully achieving project goals while simultaneously optimizing profitability are central to the results and business orientation of the superior project manager. These behaviors, as well as a high degree of initiative, make up the achievement cluster.

High-performing project



1 Select your ingredients from hundreds of sources. Your mainframe computer. Any database. Other workstations. Even other networks in your office.

Xerox makes a better pie.

Lasography is the most revolutionary invention to hit the office since xerography.

Lasography makes the difference.

Xerox was responsible for both.

But while xerography faithfully copies your documents, Lasography actually lets you create original documents.

And that means more than producing a laser-sharp pie chart.

Lasography means creating graphics that make your point more forcefully. It means writing better letters and more memorable memos.

It means not only manipulating your data in ways you've never dreamed of. It means printing on paper exactly what you've created on the screen.

Your documents won't just look better. They'll be better.

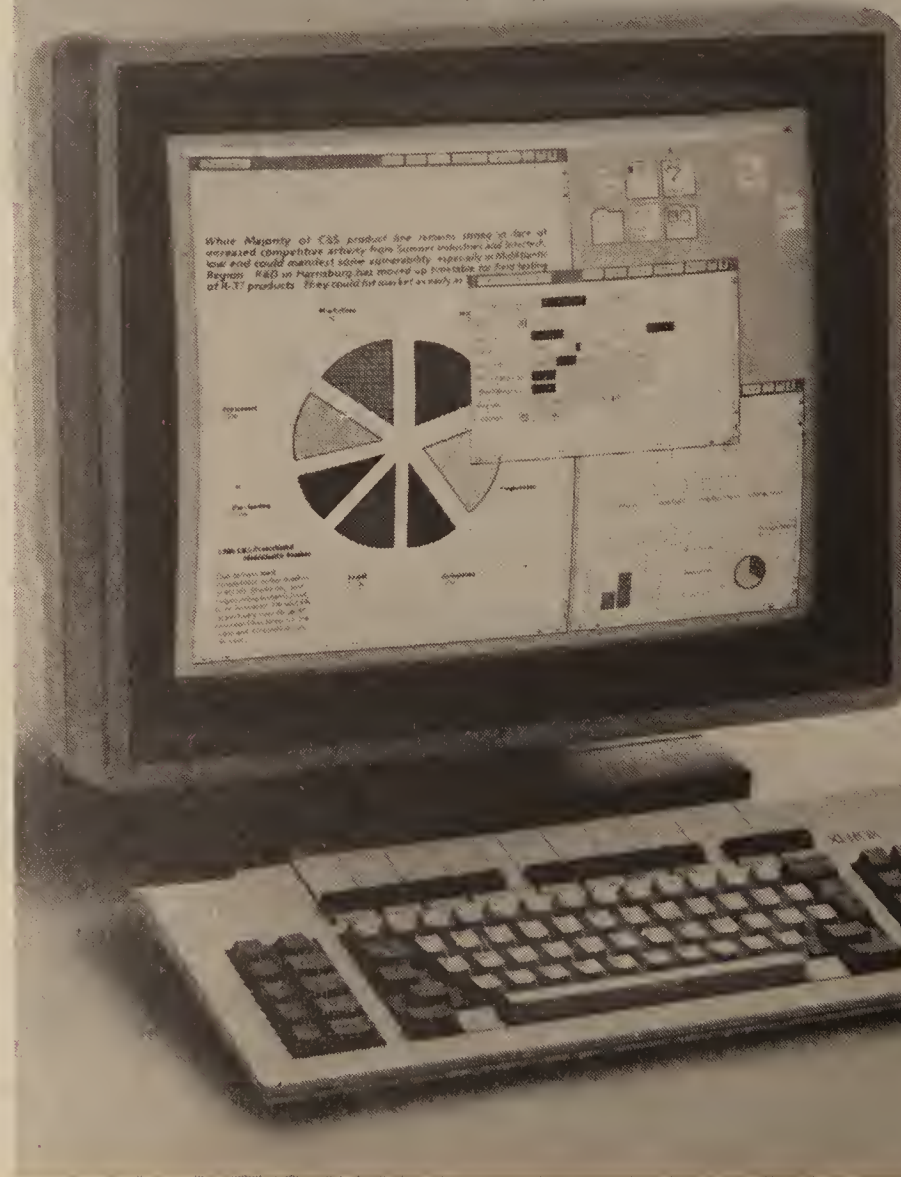
Taken separately, these products equal or surpass any on the market.

Taken together, they become a whole new way of working. And to keep your Lasographic system working, you can call on the team that invented it. Team Xerox.

Any way you slice it, you're better off with a Xerox pie than an IBM pie. Or even an Apple pie.



2 Mix text and graphics any way you like on the Xerox 6085 Professional Computer System. Create new charts. Write. Edit. Re-edit. Draw a pie an Apple can never match.



In Depth/Building a Better Project Manager

”

The superior project manager is more than a master at cookbook techniques and methods, and program evaluation and review, critical path management and other project control techniques are necessary but far from sufficient for excellence.

managers demonstrate a strong focus on accomplishing tasks. They identify clearly defined goals and devote the effort necessary to meet these goals. A consistent and well-articulated set of standards governs their own performance and that of their project team. A business orientation makes project managers recognize the relationship of their projects to strategic business objectives, including marketing and profitability.

A high level of concern for achievement is one trait demonstrated by exemplary project managers. In one example, a project manager viewed his team's job as constantly improving operations. In the team's slack time, he initiated a project that resulted in lowering the billing cycle runtime. A second project manager found a way to piggyback billing information onto another part of the system, thereby eliminating redundancy, saving

money and making the data more accessible.

MIS directors and vice-presidents rely on their superior project managers' business orientation to turn a systems development investment into bottom-line profits. Unlike the average performer, who tends to view the project as a series of tasks to complete, our exemplary performers saw their projects as miniature business opportunities to which they could bring entrepreneurial talents and relish the financial and marketing payoffs that their projects brought to the organization.

One business-oriented project manager expressed the importance of his billing programs in terms of the potentially drastic effect on company revenue if the programs failed. Another project manager conceptualized system priorities in terms of how they would benefit large groups of internal users in making their jobs — and the company — more efficient. The project manager who wanted to build the best billing system because it was a flagship system critical to the MIS organization's image and objectives also exhibited a business orientation.

Influence

As individuals grow in their management careers, they must develop the facility to get work done through others. This is especially important to project managers who rarely "own" the resources they need to accomplish their project.

Successful project managers demonstrate several clearly defined behaviors that address the ability to influence:

- Organizational and interpersonal astuteness.
- Compromise negotiation.
- Team building.
- Team member development.
- Well-defined user orientation.
- High level of self-control.

The superior project manager knows that possessing technical ability or asserting raw authority is often not sufficient to be successful. Top project managers use their interpersonal skills to understand and influence the user, project team members and their own MIS management.

The influence cluster includes those competencies that, guided by basic interactive management principles, enable the project manager to communicate effectively, build a strong project team and win the confidence and trust of both the user and the MIS organization.

Organizational astuteness, for example, was clearly demonstrated by the project manager who knew that the

XEROX

XEROX® and the identifying numbers are trademarks of XEROX CORPORATION.
IBM® is a registered trademark of International Business Machines Corporation.
Apple® is a registered trademark of Apple Computer Inc.

15%

Manufacturing
20%Personnel
13%Purchasing
10%1986 C&S Projections/
MidAtlantic Region

Due to increased competition in this market in 4Q '85, Marketing and Engineering budgets have been increased 3% and 4% respectively over fiscal '85. Personnel has been cut 3%. Legal and Accounting, cut 2% each.

Legal
12%Accounting
10%Engineering
20%

3 In the blink of an eye, an original pie. Whatever you've created on the screen, the Xerox 4045 Laser CP can create on paper. Laser-sharp. Laser-perfect.

For information call Team Xerox, your local Xerox sales office or: **1-800-TEAM-XRX ext. 160A**

Please send me more information on Xerox Lasography. Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692.

- ☐ The Xerox 6085 Professional Computer System
☐ The Xerox 4045 Laser CP
☐ Please have a sales representative contact me.

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____ CITY _____
STATE _____ ZIP _____ PHONE _____

If you can't wait, call:

1-800-TEAM-XRX ext. 160A

160A

1-800-832-6879, ext. 160A

013 5 26 86

In Depth/Building a Better Project Manager

company president "shoots from the hip" and was easily "set off." The manager used this to his advantage by getting the president excited and involved at strategic points when the project needed a push forward.

Both organizational astuteness and skillful use of influence were implemented by a project manager who used his knowledge of the system to select those parts of the organization that would be affected by a rate change. He then used this political expertise to get specific people assigned to the rate change project.

User orientation

The ability to bring a client or user orientation to their work was common to exemplary project managers. One project manager evaluated and modified his system according to the needs of the field staff

that eventually would use it.

Another project manager made a strenuous effort, whenever one of the products was finished, to contact users and ask them how they felt about the product. Still another manager wanted users to share a sense of ownership in the test plan and therefore talked through with the users what they thought was necessary to test different functions.

One might conclude from these examples that none of these behaviors are in and of themselves unusual; and, indeed, they are not. What is unique and important, however, is the process of isolating, identifying and grouping specific behaviors that result in exemplary job performance.

That process results in a behavioral model and becomes the crucial first step toward developing a performance standard and structure.

From there, the organization can begin to train and develop its current and potential personnel and encourage them to be conscious of the behaviors they automatically bring to the job, those that currently are not part of their repertoire and those that need improvement.

Basic drive

Job competency analysis provides a powerful tool to address the business objective of hiring and developing staff for maximum effectiveness. Harvard University psychologist Robert White provided the contemporary notion of competence when he defined it as "a basic drive for effectiveness."

Interest in competence is currently growing because of its direct link with behavior. The American Management Association, for example,

has outlined basic behavioral competencies for the general line manager. Also, the American Society for Training and Development, drawing on its own extensive research, has recently published a list of behavioral competencies necessary for training and developing professionals.

The job competency analysis model becomes a performance standard by which competencies can be identified in prospective and current holders of a job. It also is valuable in evaluating current performance, measuring training progress and identifying high-potential performers as well as in assisting current jobholders' self-assessment of their own performance.

MIS organizations can use this process to define any of its discrete jobs, from the technical programmer to the analyst and the senior programmer analyst. Exemplary performers in each job category are nominated and become the experts who contribute their personal experiences about what it takes to perform that job.

In building the project manager model, superior project managers were asked to discuss, in depth, critical activities and incidents in their management careers. They were to focus precisely on their behaviors and on what they actually do in their jobs rather than to focus on their espoused theories of what they should do.

The resulting data reveals the underlying motives, abilities and knowledge used by top performers, uncovering social as well as technical knowledge and skill factors critical to job performance.

The ensuing competency model contains three major components:

- The behavioral competencies that are critical for outstanding performance.
- Definitions of each competency in observable behavioral statements.
- A road map that shows the relationship between each competency and the core tasks and functions that make up the job.

The organization can then develop customized standards for both the technical and managerial rungs in the MIS job ladder.

Benefits and options

The competency model provides benefits to both the MIS and training and development departments. With this capability, all training and development efforts become much more focused, since they can be mapped directly to the specific job functions and competencies that drive exemplary performance. This is particularly persuasive when budgets are being set and training and development plans for the coming year are being developed.

Using this process, the training and development department can justify adding or not adding courses based on the functions and competencies specifically addressed and by mapping existing curriculum offerings to the competency model for each job. The MIS organization gains a powerful tool for selecting new people into the job, making decisions about the functions and configurations of specific jobs and improving the supervisor-subordinate coaching and development relationship.

Once an organization develops its competency model, several options are available to put the model to work. The group can build a

Over 50,000 satisfied business users can't be wrong. Why? Because we're offering more. Solutions, for one thing. The kind of business management solutions that we've provided over 50,000 users worldwide.

That solutions orientation drives our newest line of super-performance supermicros. They're AT&T software compatible as well as being UNIX[®]-based. That twin compatibility means literally hundreds of software choices, to meet every business need you have.

It's exactly why you should make sure it's one of our high-performance, full 32-bit, multi-user systems that's driving your application. And why you should talk to us... soon. Zilog, Systems Division, 1315 Dell Avenue, MS A2-8, Campbell, CA 95008; 408-370-5689.

*UNIX is a trademark of AT&T Bell Laboratories. Zilog is licensed by AT&T Technologies.

Systems Division
Zilog
an affiliate of **EXXON** Corporation



How we improved Structured Query Language.

Actually, we didn't change a thing.

We just combined it with the best relational database management system.

Introducing INFORMIX®-SQL.

It runs on either MS™-DOS or UNIX™ operating systems. And now with IBM's SQL as part of the program, you can ask more of your database. Using the emerging industry-standard query language.

To make your job easier, INFORMIX-SQL comes with the most complete set of application building tools. Including a full report writer and screen generator. Plus a family of companion products that all work together.

Like our embedded SQLs for C and COBOL. So you can easily link your programs with ours. File-it!™, our easy-to-use file manager. And C-ISAM™, the de facto standard ISAM for the UNIX operating

system. It's built into all our products, but you can buy it separately.

And when you choose RDS, you'll be in the company of some other good companies. Computer manufacturers including AT&T, Northern

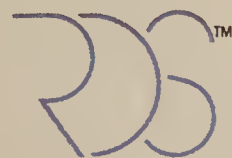
Telecom, Altos and over 60 others. And major corporations like Anheuser Busch and The First National Bank of Chicago.

Which makes sense. After all, only RDS offers a family of products that work so well together. As well as with so many industry standards.

So call us for a demo, a manual and a copy of our Independent Software Vendor Catalog. Software vendors be sure to ask about our new "Hooks" software integration program. Our number: 415/322-4100.

Or write RDS, 4100 Bohannon Drive, Menlo Park, CA 94025.

And we'll show you how we took a good idea and made it better.



RELATIONAL DATABASE SYSTEMS, INC.

INFORMIX is a registered trademark and RDS, C-ISAM and File-it! are trademarks of Relational Database Systems, Inc. IBM, UNIX and MS are trademarks of International Business Machines Corporation, AT&T and Microsoft, respectively. © 1985, Relational Database Systems, Inc.

How does recovery handle

• AM

3:45

POWER INTERRUPT FAILLURE

3:40:01 START IDMS/R

3:40:03 WARMSTART RECOVERY STARTED

3:43:05 DATABASE RECOVERY COMPLETED

3:45:16 DATABASE AVAILABLE

your automatic a system crash?



PROBABLY NOT like Cullinet's IDMS/R.

Most "automatic" recovery utilities are anything but. In fact, the "automatic" utilities of most data base products are in actuality **automated**. There **is** a difference.

"Automated" means that ordinarily manual operations are facilitated, but still require the intervention of operations or systems personnel.

IDMS/R's database utilities are truly automatic, requiring no human intervention. Which means with a power failure, for example, that upon restart, IDMS/R recovers all transactions, completely re-establishes all transactions, and completely re-establishes data integrity. All automatically. All without lifting a finger. Even in the wee small hours.

Automatic vs. Automated. A significant difference. And if it matters to you, you'll choose the most technically advanced database management system available, Cullinet's IDMS/R.

Especially for things that go bump in the night.

**For information, phone us, toll-free,
at 1-800-551-4555.**

The Leader in Information Systems Software

Cullinet

© 1986 Cullinet Software Inc.
400 Blue Hill Drive, Westwood, MA 02090-2198 (617) 329-7700

In Depth/Building a Better Project Manager

simulation or case study in which the participants are required to demonstrate the functions and competencies in a real-life business problem. This becomes part of a classroom-based assessment process that enables jobholders to get a profile of the extent to which they bring the behavioral competencies to their jobs. The jobholders also receive important data on which functions and competencies they need to develop.

An additional useful tool is a series of informal assessment questionnaires that tap into how well individuals perform basic functions and tasks, the competencies that they naturally bring to the job and, in the context of specific assignments, the competencies that each assignment requires. The questionnaires help construct a profile that looks at the competencies demanded by the par-

ticular job matched against those brought by the person. Gaps in the profile become targets for development through courses, coaching and on-the-job experience.

Some organizations may choose to focus on developing the coaching competencies required by managers. Seminars are designed to teach supervisors and managers how to coach and develop others more suc-

”

The competency model permits description of the fundamentals of a job and the skills of those individuals who do the job very well. A common language is brought to those who hold the job or aspire to it, as well as to those who manage it.

cessfully. For project managers, this is particularly critical, since virtually all of the exemplary project managers involved in the model's development addressed the importance of focused, on-the-job experiences and the presence of a coach and mentor.

In contrast, none of these project managers attributed their successes to the typical two- or three-day project management course in planning

and control techniques. Almost unanimously, they addressed the role of their manager in helping them develop the behavioral competencies that distinguish average from superior performers.

More benefits, fewer surprises

An organization can reap major benefits from using a job competency approach. The project manager competency model, for example, permits description in specific behavioral terms of the fundamental elements of the job and the characteristics and skills of those individuals who do the job very well. A common language is brought to all those who hold the job or aspire to it, as well as to those who manage it.

The behavioral indicators can be used in many personnel or human resource development functions. Nondiscriminatory selection tests and interviewing programs can be developed. The performance appraisal process can be made more behavioral and objective.

Training and development programs can be built to address specific behaviors and thereby be far more cost-effective. The department or organization in which the job function resides — in this case MIS — can make important strategic decisions about its relationships with other functional areas of the organization.

A project manager competency model brings these additional benefits to the MIS organization:

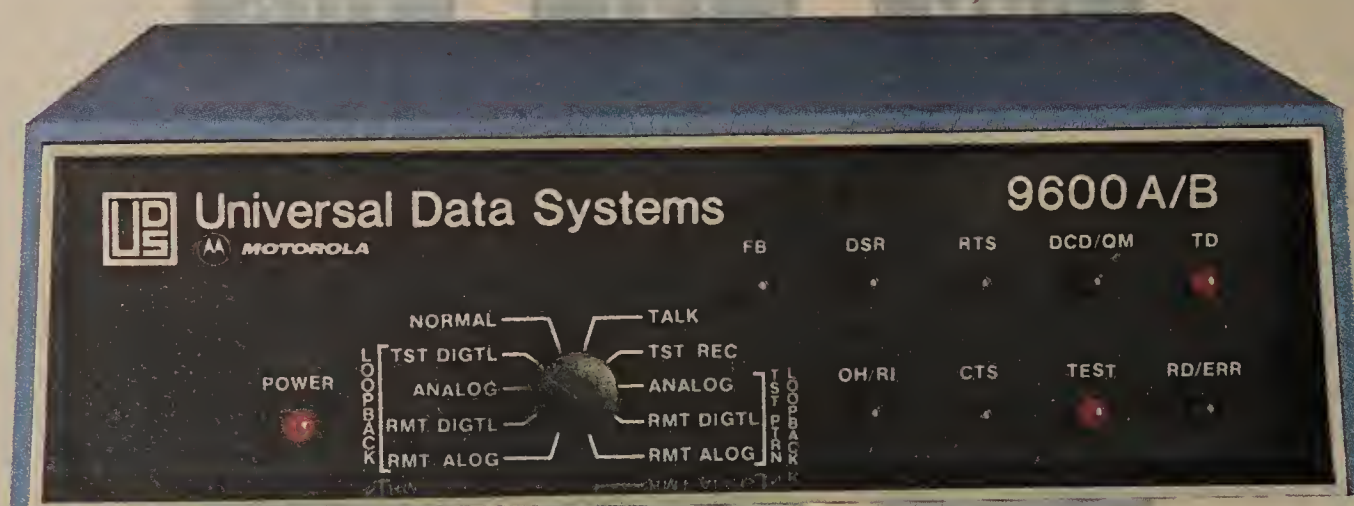
- A valuable behavioral screen for the project manager hiring process.
- A diagnostic tool that enables the MIS organization to analyze a project assignment in terms of its critical success competencies and match that assignment with a project manager strong in those areas.
- A structured, individualized coaching and development program that arises out of discrepancies between the project's demands and the manager's competency profile.
- A succession-planning tool that enables the MIS director to analyze systematically current and anticipated staffing and training needs for systems development efforts.

Project leaders who participated in a project manager development program built from the competency model cited several bottom-line results for their MIS departments. The first of these was visible improvement in the work product. Better communications, scheduling and testing have led to a better quality product with fewer errors. This is particularly true for large projects.

Further, errors were noted at earlier stages of the project. Fewer surprises were uncovered because of more careful preplanning and discussion of all involved parties. As one project manager put it, "If there are misunderstandings, oversights or errors, we're catching them at the beginning."

The project manager development program offers MIS a strategic tool that ensures its successful project management capability. The MIS vice-president setting out strategic objectives for the coming year might ask, "Is the development program worth it? Can I afford it?"

Instead, ask an even more fundamental question: "Can I afford not to have a pipeline of superior project managers?" The answer, of course, appears on the bottom line. The mystique is a mistake — you *can* make excellent project managers. ■



Dial Now, Dedicate Later at 9600 bps

Take your datacomm system to 9600 bps now. You can do it with UDS 9600A/B modems! Buy them today and instantly speed up your system on the dial-up network. Later, when traffic growth demands an upgrade, three simple strap changes will adapt your modems to dedicated lines.

The UDS 9600A/B provides optional data rates of 7200 and 4800 bps. Communication may be half-duplex (two-wire) or full-duplex (four-wire, V.29). A wide range of integral test capabilities simplifies system diagnostics.

Don't wait to accelerate your datacomm system throughput. Dial-up or dedicated, you can move

to 9600 bps now. For complete details, contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Phone 205/837-8100. Telex 752602 UDS HTV.

QUANTITY ONE PRICE \$1,995



Universal Data Systems



MOTOROLA INC.
Information Systems Group

Inquiry Hotline: 800/633-2252, ext. 373

UDS modems are offered nationally by leading distributors. Call the nearest UDS office for distributor listings in your area.
DISTRICT OFFICES: Atlanta, GA, 404/998-2715 • Aurora, CO, 303/368-9000 • Blue Bell, PA, 215/643-2336 • Boston, MA, 617/875-8868 • Columbus, OH, 814/895-3025 • East Brunswick, NJ, 201/238-1515 • Glenview, IL, 312/998-8180 • Houston, TX, 713/988-5506 • Huntsville, AL, 205/837-8100 • Issaquah, WA, 206/392-9600 • Mesa, AZ, 602/820-6611 • Milwaukee, WI, 414/273-8743 • Minnetonka, MN, 612/938-9230 • Mountain View, CA, 415/969-3323 • Richardson, TX, 214/680-0002 • St. Louis, MO, 314/434-4919 • Silver Spring, MD, 301/942-8558 • Tampa, FL, 813/684-0615 • Thousand Oaks, CA, 805/496-3777 • Tustin, CA, 714/869-8001 • Unlondale, NY, 516/222-0918 • Willowdale, Ont., Can, 416/495-0008 • Ypsilanti, MI, 313/483-2682

Created by Dayner/Hall, Inc., Winter Park, Florida

In Depth

Existing information resources can give you the competitive edge

By DONALD MARCHAND
and FOREST HORTON JR.



MIS directors are learning to use already available information resources to extend corporate business strategies and services — thereby adding value to their companies.

It is one thing to use information resources strategically inside the firm for cost leadership or product differentiation. It is another matter to find new and creative ways to use information resources in pursuing business strategies.

Increasingly, leading firms are using existing information resources in new ways — that is, reinventing and adding value to investments that have already been made.

For example, in California, Mobil Oil Corp. is marketing gasoline by installing point-of-sale terminals at the gas pumps that can be used with the automated teller machines of two leading banks.

Sears Roebuck & Co. and J. C. Penney Co. are using videodisks and personal computers to automate their customer order catalogs and extending the use of their walk-in services by offering the same catalog information to customers at home.

Textile companies in South and North Carolina are arming their salesmen with videodisk players so that the salesmen can effectively demonstrate to potential customers the color and style variations of lines of products the companies offer.

Airlines, car rental firms and hotels are teaming up to offer new bonus programs for frequent travelers through automated systems that are able to track bonus points and disburse awards.

What all of these examples have in common is the use by companies of existing information resources or technologies in new and creative ways.

This trend is supported by an equally strong tendency to permit entrepreneurs within companies to acquire resources and organize internal units to

experiment with and pilot-test new uses of information resources to market, sell and distribute products and services.

Extending services

Hence, new units are being formed both within and without traditional MIS or data processing departments to do electronic banking, telemarketing, videotex and home retailing, point-of-sale development and information retailing and wholesaling. Their objectives are usually to research and pilot-test new and creative ways of extending the services and products of the company by building on existing information resources about customers, buyers or suppliers and extending, through information technologies the services offered in new or existing markets.

For example, the Buick division of General Motors Corp. has organized a Marketing through Technology department to develop a new information system called Epic to aid in the marketing of its automobiles. Epic is being used by Buick in dealer showrooms, in public areas such as hotels and shopping malls and in homes via videotex services.

In dealer showrooms, the Epic system uses PCs in kiosks that allow a salesman to respond to customer questions about the availability of various models, colors, options, prices and financing terms for Buick cars. If a customer is interested in a particular model, the salesman can use Epic to determine the nearest dealership that has the car, and if the customer is comparison-shopping with other makes of cars in mind, the salesman can, through Epic, use another videotex service, CompuServe, Inc.'s CompuServe, to get data on most makes and models of cars to compare with the Buick model under consideration.

Thus, Epic provides better and more accurate information about the Buick product line to salesmen and customers alike as well as integrates the use of a car locator system for inventory control and an external information service for comparison shopping. The long-term mission of the Marketing

Excerpted from Infotrends: Profiting from Your Information Resources, by Donald A. Marchand and Forest W. Horton Jr. Copyright © 1986, John Wiley & Sons, Inc. Reprinted by permission of the publisher.

In Depth/Information Resources

”

One method for using information resources strategically is based not on the capability of finding new uses for known information but on using information resources in offering a new product or service. Information resources are embedded in the new service or product in such a way as to appear indistinguishable from the nature of the product or service itself.

Advertisement

Advertisement

SYSTEM 2000® DBMS Drives Industry with \$12,000 License

SAS Institute Inc. establishes SYSTEM 2000 Data Base Management System at the forefront of cost-saving productivity tools with its \$12,000 first-year licensing plan. The system includes: an integrated data dictionary, on-line query/update, a report generator, relational data base access, programming language interfaces, high-quality training and technical support, and more.

In addition, users can now link SYSTEM 2000 DBMS with the SAS® System of software to build data bases, store and retrieve data, merge and manipulate data, perform analyses, and produce reports and presentation graphics. Even Information Center users can gain access to SYSTEM 2000 DBMS through easy-to-use SAS menus.

To learn more about the most economical data base management system in the industry, write or call the SYSTEM 2000 Sales Department at SAS Institute Inc., Box 8000, SAS Circle, Cary, NC 27511-8000. Telephone (919) 467-8000. Telex 802505.

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA. Copyright © 1986 by SAS Institute Inc. Printed in the USA.

through Technology department is to determine the profitability of using new technologies to extend the reach of information resources in creative directions to enhance the sales effectiveness, inventory control and productivity of the dealer work force.

One of the most strikingly creative ways of using "old" information with "new" information technology we've encountered is provided by Robert Waggoner. As reported in *Business Week* (March 4, 1985), Waggoner bought one-third of an antiquated newspaper clipping company, Burrelle's Information Services, Inc.:

"It [Burrelle's] was on a slow track to nowhere. Sales were growing at a sluggish pace, profits were modest — and Burrelle's was still cutting and pasting much the way it did when it was founded in 1888. But Waggoner changed all that. The hustling Harvard MBA pushed Burrelle's as a growth company.

"It now [through a computer system] monitors 16,000 newspapers, magazines and trade journals for 40,000 categories, from company and product names to political issues. Customers say they've come to regard fast access to clips as a necessity."

New product or service offerings

One method for using information resources strategically is based not on the capability of finding new uses for known information but on using information resources in offering a new product or service. In this case, information resources are embedded in the new service or product in such a way as to appear indistinguishable from the nature of the product or service itself. In recent years, many examples of companies inventing new products or services in which information resources play the pivotal or key role have begun to appear.

In 1977, Merrill Lynch, Pierce, Fenner and Smith, Inc. first announced its new cash management account, which was an information resource product that permitted the integration of four services to investors:

- Automatic investment of cash and dividends in a Merrill Lynch-managed money market account.
- Credit through a standard margin account.
- Cash withdrawal by check or debit card.
- Investment advice in managing and diversifying the account. Although each of the services standing alone was not innovative, the integration of these services in a single product — the cash management account — provided an unprecedented competitive advantage for Merrill Lynch.

The cash management account was supported by a complex network of data bases, voice/data communications networks and software programs. It was sold through Merrill Lynch's brokers to investors with minimum balances of \$20,000.

Although the growth of the cash management account has slowed in recent years, Merrill Lynch was able to amass more than 450,000 accounts and \$20 billion in assets before serious competition appeared in 1982 from other investment houses (for example, Dean Witter Reynolds, Inc.), banks and financial services companies.

Moreover, since the invention of

the cash management account concept, banks and financial service companies have used their financial information resources and computer and communications technology to manufacture whole new types of financial products "on the fly."

Charles Wiseman and Ian MacMillan, in an article in *The Journal of Business Strategy* (Fall 1984), provide an interesting example of the development of a certificate of deposit (CD) fund by a large investment firm:

"At 6 a.m., leaders at a brokerage house called London to order sheaves of CDs from foreign banks, which often pay higher rates than their U.S. counterparts. By 11 a.m., they had accumulated \$50 million of the paper. The next step in the fund creation process depended on an information system that took the prices and rates, juggled them according to the firm's objectives and constraints embodied in its computer program and arrived at management fees and commissions. Thirty-six hours after the start of this production run (job shop style, to be sure), brokers were ready to start selling the fund."

The creation of new financial products on a real-time basis has brought the principles of "flexible manufacturing" to the financial services industry. Portfolio management systems of companies such as Shearson Lehman Brothers, Inc., Citicorp, Bankamerica Corp. and others offer new opportunities to tailor complex combinations of investment services to businesses or consumers with diverse assets and investment outlooks.

Similarly, in the express delivery industry, the merger of transportation (air, land) and communications services (facsimile and imaging machines) has resulted in the creation of new competitive products. During the early 1980s, Federal Express Corp. began planning and developing a new delivery service called Zap Mail, which depended on the availability of improved imaging technology and the mobilization of its fleet of 10,000 delivery vans. In its initial phase, Federal Express offered a two-hour delivery, enabling customers to send high-quality duplicates of documents and diagrams to recipients thousands of miles away in the U.S.

Customers call Federal Express for a Zap Mail pickup. A Federal Express courier picks up the document and takes it to the nearest Federal Express Imager I machine. The machine electronically transmits the document to the Federal Express facility closest to the recipient, where a high-quality duplicate is placed in a Zap Mail envelope and delivered by courier within two hours. The price when the service was initiated was \$35.

In May 1985, Federal Express extended this basic service by leasing 3,000 Imager II machines to some of its heaviest users. With the Imager II, customers can transmit and receive documents from Federal Express, eliminating the need for pickup and, in some cases, ending the need for delivery.

The Imager technology and the fleet of Federal Express vans are designed to eliminate problems that have plagued businesses using previously available facsimile transmission services. Those problems included poor quality, slow transmissions

SELL YOUR COMPUTER PRODUCTS IN VENEZUELA.

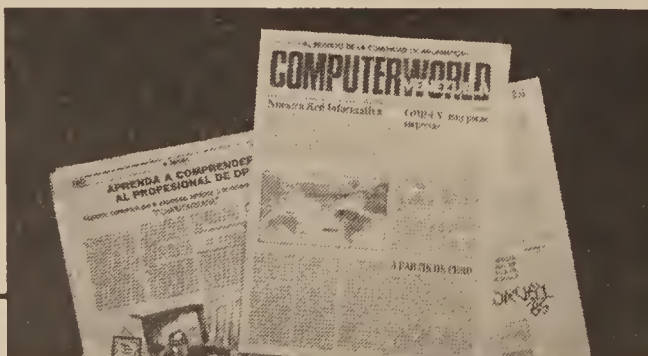


Advertise in *Computerworld Venezuela* and sell your products directly to Venezuela's thriving computer community. According to International Data Corporation, the world's leading market analysis and consulting firm for the information processing industry, Venezuela is the third largest computer market in Latin America.

Your ad in *Computerworld Venezuela* reaches 5,000 computer professionals throughout Venezuela, including MIS managers, DP staff and computer equipment suppliers. Published every other Monday, *Computerworld Venezuela*

reports on the latest developments in hardware, software, terminals and supply products.

CW International Marketing Services makes advertising your products in Venezuela, and around the world, easy. We have over 55 publications in more than 25 countries. For more information on our wide range of services, complete the coupon below and mail today.



Please send me more information on:

- ☐ *Computerworld Venezuela*
☐ Your other foreign publications

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____



CW COMMUNICATIONS/INC.

Frank Cutitta
Managing Director
International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701-9171

In Depth/Information Resources

and lack of compatible machines to send and receive documents. By the late 1980s, Federal Express expects at least 30% of its revenue to come from Zap Mail.

Federal Express' approach to Zap Mail, which relies on the delivery of hard copies, is not without criticism in the competitive market by those who argue that long-term growth and profits in this market will be in high-speed data transmission services using computers and word processors such as MCI Communications Corp.'s MCI Mail.

In MCI Mail, for example, a message can be typed into a computer that has access to the MCI system. The message may be sent through MCI to the recipient's computer or printed at a station near the recipient for hand delivery by a local courier. The service is less expensive than Zap Mail; however, it is harder to use and cannot send charts and graphs.

MCI Mail's application is aimed at customers who wish to send one message to hundreds or thousands of recipients.

"

The creation of financial products on a real-time basis has brought the principles of 'flexible manufacturing' to the financial services industry.

For example, a manufacturer who wants to send a single message to dealers can type the message into a computer in which a list of dealers' names and addresses has already been stored. With a few keystrokes, the manufacturer can send the message to hundreds of recipients at a cost of only a few dollars for each recipient.

The competition for market share between Zap Mail and MCI Mail represents a clear use of information resources for competitive advantage. Moreover, what is at stake in this competition is not just product differentiation but cost leadership.

In addition, both Federal Express and MCI are using information technologies to tie their customers directly to their product offerings by making on-premise software and hardware available for the customer to interact with the network.

Similarly, financial service companies and banks are moving beyond the design of new products such as cash management accounts and portfolio management systems by offering these services to customers who are directly tied to the seller's data bases and communications links by terminals and personal computers. Innovation in the design of new information-based products and services spills over into their marketing and distribution.

Marketing and distribution

Another strategy for using information resources to competitive advantage involves using these resources to market and help distribute a product or service.

Although electronic marketing will not replace more traditional

forms of marketing in the near future, it does provide new types of trade-offs in the expected benefits and costs of direct marketing.

Shopping malls and outlets will continue to be an important part of retailing in the U.S. However, communications and computer technologies will be used increasingly in homes, offices and many public places to permit more widespread shopping for many goods and services.

Direct marketing is another term for selling without stores. The Direct Marketing Association defines direct marketing as "an interactive system of marketing which uses one or more advertising media to effect a measurable response and/or transaction at any location." While direct marketing is often thought of just as direct mail, it also includes the use of radio,

TV, telephone, print ads, coupons, store catalogs, package inserts, bill stuffers and even matchbook covers.

Compared with newspaper, magazine, radio and TV advertising, direct marketing is interactive. Moreover, in its electronic forms, direct marketing can establish direct links with customers 24 hours a day from practically anywhere in the nation. In addition, direct telemarketing compares favorably with other forms of more conventional marketing. While telemarketing does not compete with television for mass-market appeal, in every other feature it either equals or surpasses TV, space ads and direct mail letters when these are used alone.

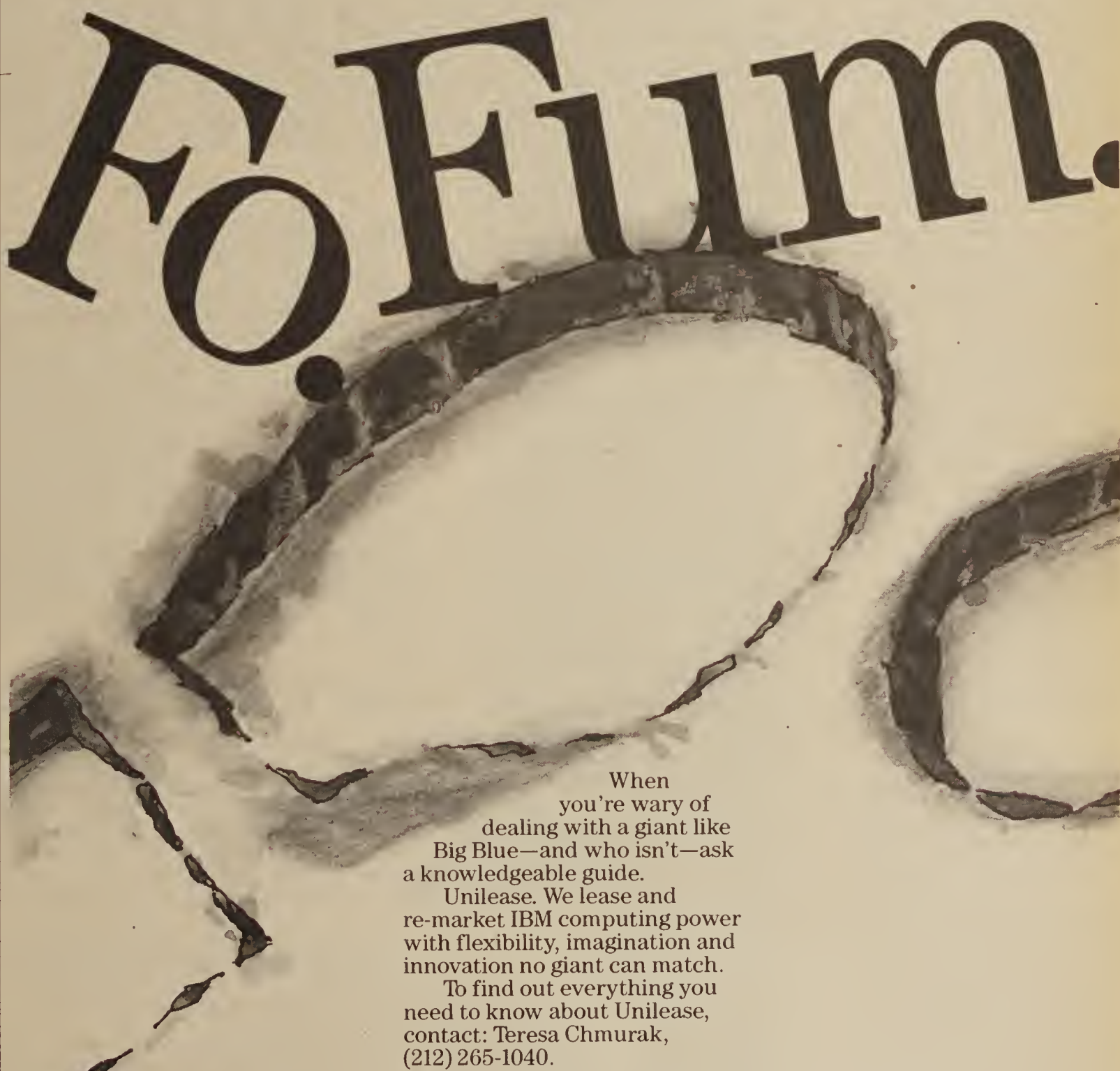
As the oldest form of electronic marketing, telemarketing has been used to sell virtually all types of products and services. In recent

years, firms have combined telemarketing strategies with personal computers and videodisks to provide new forms of direct marketing.

Among the top 30 direct marketing firms in the U.S., it is difficult to identify any that have not begun to develop computers and communications technology based on marketing strategies.

Sears Roebuck and J. C. Penney are pilot-testing, with IBM and AT&T, new home videotex services to offer two-way, home shopping services. Moreover, most major retailers are developing ways of using videodisks and personal computers to automate their catalogs.

Cosmetics firms such as Avon Products, Inc. and Elizabeth Arden, Inc. are offering computer-based makeup analysis to provide customers with more individualized



When you're wary of dealing with a giant like Big Blue—and who isn't—ask a knowledgeable guide.

Unilease. We lease and re-market IBM computing power with flexibility, imagination and innovation no giant can match.

To find out everything you need to know about Unilease, contact: Teresa Chmurak, (212) 265-1040.

☐ Please send me a copy of "Everything you need to know about Unilease." CW

Name

Title

Company

Street

City State Zip

Unilease Computer Corporation
1370 Avenue of the Americas
New York, NY 10019
ATTN: Teresa Chmurak



UNILEASE

(212) 265-1040 New York Orlando Los Angeles London Düsseldorf Paris

In Depth/Information Resources

cosmetic recommendations.

Personal and property-based insurance companies are offering mall customers the option of using a videotex kiosk as a means of finding the most cost-effective insurance policies for their needs. Upscale retailers such as L. L. Bean, Inc. in Freeport, Maine, use computers to combine sophisticated systems for order handling, tracking customers and inventory, sampling mailing lists and performing complex modeling exercises of direct marketing strategies.

Finally, real estate brokers are using videodisks and personal computers not only to automate listing services but also to provide video images of properties and houses that prospective buyers can screen instead of going on time-consuming weekend house-hunting expeditions.

In addition to these forms of electronic direct marketing, most major retailers are linking with banks and credit card companies to develop point-of-sale systems that provide customer convenience as well as increase the company's ability to track inventories on a daily rather than a weekly or monthly basis.

As the lines between the physical store and electronic store continue to blur, it will be difficult in the future to design effective product and service marketing strategies without considering the trade-offs of costs and benefits inherent in all forms of electronic and traditional marketing.

The manufacturing process

Managing the information resources within the manufacturing process more effectively can also be employed in the strategic use of information resources. During the last 15 years, a dramatic change has occurred in both Japan and the U.S. concerning the role of manufacturing as a competitive weapon. Throughout the 1970s and early 1980s, manufacturing productivity declined in the U.S., while it rose significantly in countries like Japan and West Germany.

While the exact causes of the changes in productivity have yet to be defined, a change clearly occurred in the significance given to quality control and process manufacturing among Japanese and West German businesses in contrast to U.S. manufacturers. Indeed, a growing debate evolved in the international business community concerning how to adopt quality control and manufacturing improvements used in Japan, West Germany and other advanced economies into American manufacturing.

Throughout this period, two types of quality improvement strategies have

been adopted: The first type is very technology intensive and is aimed at improving the design, production and control of products throughout the manufacturing process through the use of computers and communications technology. Manufacturing management is very dependent on the information resource strategies used to control the production, inventory, quality control and cost-control functions. These functions are in turn

influenced by three support functions:

- The industrial/engineering function, which influences the design of products.
- The internal job scheduling and production control system.
- The manufacturing intelligence function, which monitors the use of labor and suppliers.

For all of these functions to work effectively, a great deal of information management is required. In recent

”

As the lines between the physical store and electronic store continue to blur, it will be difficult in the future to design effective product and service marketing strategies without considering the trade-offs of costs and benefits inherent in all forms of electronic and traditional marketing.

IBM ASCII terminals:

The case in black and white.

Introducing a somewhat more colorful member of the family.

Meet the IBM 3164 ASCII Color Display Station.

It gives you eight foreground and eight background colors. On a 14" screen.

And because of its 8 x 16 character matrix, the 3164 gives you clear, crisp characters in color.

But is color any reason to buy IBM's 3164? It is, according to studies that indicate the use of color increases productivity, decreases errors and promotes user satisfaction.

Color, of course, is far from the sole reason for choosing the 3164. To appreciate the others, you should get to know the rest of our ASCII family.

Emulation.

Another side of the family.

Our ASCII terminals are designed to fit into existing systems. Even if the systems aren't ours.

Emulation Capability	
3161	IBM 3101 Model 881 ADDS Viewpoint* Hazeltine 1500* Lear Siegler ADM-3A* Lear Siegler ADM-5* TeleVideo 910*
3163	IBM 3101 Model 881 DEC VT 52* DEC VT 100* TeleVideo 950*
3164	IBM 3101 Model 881

For example, our basic ASCII Display Station, the IBM 3161, emulates up to six

Features	3161	3163	3164
Screen size	12"	12"	14"
Lines x characters	25x80	25x80	25x80
Character matrix	8x16	8x16	8x16
Double-sized characters	No	Yes	Yes
Line drawing characters	24	24	24
Vertical scroll	Jump	Jump/Smooth	Jump/Smooth
Definable function keys	24	24	24
Windowing	No	Yes	Yes
Partitioning	Horiz.	Vert./Horiz.	Vert./Horiz.
Characters in buffer	1920	7680	7680

programmable function and editing keys so they can be custom-tailored to fit your application needs. The 3163 and 3164 models also have redefinable and recappable keys.

Superior ergonomic design isn't confined to the key-

terminals. And the advanced-function 3163 emulates a number of higher level ASCII data streams.

What's more, every one of our ASCII terminals can operate in its own function-rich native mode.

Our family is flexible.

Our unique plug-in cartridges allow for considerable flexibility in your operation. For example, simply by switching cartridges you can shift a terminal from one data stream to another.

And, in many countries cartridges are also available that go beyond emulation to let you operate your ASCII terminals in several foreign languages. Appropriate foreign language keyboards are also offered.

Enhanced ergonomics. Another family trait.

All our ASCII terminal keyboards have 102 keys. But that's not all they have in common. Every keyboard also has a low profile, gentle contour and typewriter touch.

And our keyboards have

board, however. All three displays tilt and swivel for maximum user satisfaction. And, of course, by making the display easy to read, we made it easier on the eyes. In addition to the 8 x 16 character matrix, we gave it an advanced non-glare etched screen, cursors, and character and field attributes like blink, reverse video, under-scoring and dual intensity.

High standards.

Competitive prices.

Quantity discounts are offered, too. And financing is available through the IBM Credit Corporation. Best of all, each terminal comes with the quality, service and support you'd expect from IBM.

Contact your IBM marketing representative, or call 1 800 IBM-2468, Ext. KC/90, for the IBM Authorized Distributor nearest you. And we'll present more evidence in the case for IBM's ASCII terminals.

It may be all you need to color your view.

*ADDS Viewpoint is a trademark of Applied Digital Data Systems, Inc.; Hazeltine 1500 is a trademark of Hazeltine Corp.; Lear Siegler ADM-3A/ADM-5 are trademarks of Lear Siegler, Inc.; TeleVideo 910/950 are trademarks of TeleVideo Systems, Inc.; DEC VT 52/VT 100 are trademarks of Digital Equipment Corporation.

In Depth/Information Resources

years, this need has resulted in the development of highly automated systems such as manufacturing resource planning and computer-aided design and manufacturing.

The second type of quality improvement strategy, in contrast to the first, is very people intensive. It is aimed at improving the way workers are motivated, the way they work together as teams to solve problems and make operational decisions and the way they interact with and

use new technologies.

A variety of techniques and policies assist the worker in becoming a more informed decision maker and participant in the production process. These include quality control circles, job sharing and improved education and training on the job. All of these strategies have, as an integral component, the provision of a closer link between the manufacturing process and the information that workers need to make

more effective decisions on the job.

Thus, as manufacturing increasingly has been perceived as a competitive weapon in the 1980s, the objectives of quality improvement and productivity have required improved information resources, human resources and technical strategies.

Info management as a sideline

An organization may find that entering the informa-

tion management business as a by-product of what it does as its main business can be an outlet for using information resources competitively. Many firms in manufacturing and services have accumulated a wealth of experience and internal skills that can form the basis of a new service. In some cases, capitalizing on this corporate wealth may result in a new consulting service; in other cases, it may result in a new information service.

In the first case, over the years many large corporations such as Du Pont Co. and General Electric Co. have accumulated considerable experience in specific areas such as health and safety management services or facilities management. These companies, in turn, have marketed these skills outside the company as a value-added service.

In the second case, companies such as Policy Management Systems Corp. (a software service company for the property and casualty insurance market) or Dun & Bradstreet Credit Services (a credit reporting service company), have acquired information resources about their customer bases that they can market as new information services.

William King of the University of Pittsburgh gives the example of Foremost-McKesson, Inc.'s Drug and Health Care Group, which used innovative information systems to gain a competitive edge in a noninformation business. In Foremost-McKesson's case, King found, the company needed to make major changes in the structure of drug wholesaling and to get into new information businesses such as the processing of insurance payments related to drug purchases in order to survive.

Other approaches

Another approach to entering the information management business from this angle is to capitalize on the physical resources a company may have. For many years, companies in manufacturing or in services with underutilized capacity in computer operations have offered external time-sharing and computer services. Today, railroads are using their rights-of-way to establish major fiber-optic communications networks and are marketing these services to other companies.

A third approach to entering the information management business is to enhance the information value of one's products. In this case, manufacturing companies can enter the information business by engaging in system selling as opposed to product selling. Selling solutions to customer problems requires a great deal of enhanced expertise and information management to respond to diverse customer problems. In some cases, companies have organized specific service units to offer specialized expertise and technical help for a price.

For example, fertilizer companies have offered farmers specialized software programs to assist in analyzing crop characteristics and fertilizer needs for more than 15 years. Moreover, some aerospace firms have provided computer services

The case in color.



In Depth/Information Resources

and industry management consulting and software design on a for-profit basis, while other large corporations have engaged in marketing communications network-management services based on their internally developed expertise in this area.

The routes to the information management business that firms can take are quite diverse. More than anything else, what is required is a realization of the firm's real value in information investments, both in people and in data bases that can be treated as physical assets and capitalized. All that is needed is an entrepreneurial spirit to look beyond the borders of one's traditional business lines for new opportunities.

Collaborative ventures

One basic strategy for using information resources for competitive advantage is to engage in a collaborative information management venture. In the information economy, business has become too demanding and fast paced for a company to mount a significant presence in the marketplace across all its business lines. Increasingly, more emphasis is being placed on leveraging in a cooperative way the resources of two or more firms to provide entry

or a presence in selected markets.

In a 1984 study of 38 collaborative ventures, conducted by the consulting firm of Coopers & Lybrand, interviews with participating executives revealed that the sharing of resources and complementary strengths were the two leading reasons for collaborative ventures. Underlying the reasons for collaboration were the convergence of technological innovations that blurred boundaries between markets and industries as well as the pace of international competition, which required companies to form new alliances.

Collaborative ventures have traditionally been used in the manufacturing sector primarily because of larger capital requirements. However, more recent trends indicate the growth of ventures among firms in the information processing industry as well as among traditional service or manufacturing firms that wish to enter this industry.

Moreover, although research and development ventures such as the Austin, Texas-based Microelectronic and Computer Technology Corp. (MCC) — in which 15 major U.S. computer firms are partners — have been among the more visible collabora-

tions, the more common ventures occur among firms seeking an equity investment in another company, undertaking specific lines of business that do not entail creation of a new company or joining together to form a stand-alone company for the purpose of entering a new market.

The chart at left provides some examples of these types of ventures. In type one, a collaborative venture often results in outright ownership or majority shareholding of a company. In many cases, the acquired company is allowed a great deal of latitude in conducting its business, at the discretion of the parent company. IBM's acquisition of Rolm Corp. and the General Motors acquisition of Electronic Data Systems Corp. both fall into these latter cases.

In still other cases, a company may set up its own subsidiary to enter a new business and then acquire a majority interest in an outside company as well. For example, in 1982, Ford Motor Co. created Ford Aerospace Satellite Corp. as a subsidiary to operate satellites and lease space in them to companies for voice and data transmission. Then, in 1984, Ford increased its customer base and expertise in the voice/data communications field by agreeing to purchase 80% of San Diego-based Starnet Corp.

In type two — the research and development venture — two or more companies agree to share the costs and results of basic R&D. In August 1982, MCC was incorporated in re-

sponse to concerns about the Japanese fifth-generation computer project. MCC's intent is to share R&D personnel and resources from a number of computer companies to evolve strategic initiatives in the knowledge management and expert systems field.

In type three, two companies may share their involvement in a new service without need of forming a third independent business unit. In the fall of 1984, Communications Satellite Corp. (Comsat) and Holiday Inns, Inc. approved a joint venture to offer television programming and teleconferencing by satellite to the hotel chain's 1,500 U.S. facilities.

In a fourth type of venture, two companies agree to form an independent business unit. In the early 1980s, IBM and Aetna Insurance Co. created Satellite Business Systems to enter the market for satellite-based data transmission services for large corporations.

While there are many examples today of the traditional and emerging firms entering into joint ventures, it is important to note that as the information economy and information processing industry continue to evolve, the need for collaborative ventures will continue to accelerate. Moreover, collaborative ventures in the information management business will be used as both offensive and defensive weapons in the marketplace to hold off increased competition or entry on the one hand and to explore and focus on new market niches on the other.

Also, as the information processing industry emerges as the world's leading business, the boundaries for collaborative ventures will extend far beyond national economies. One example is AT&T's recent joint venture with Italy's Ing. C. Olivetti & Co.

Information resources historically have always played a role in shaping the competitive strategies of business. There is and will continue to be a growing role for information resources in the shaping of business strategies in the years ahead because of the evolution of the information economy and the dynamic growth and dominance of the information processing industry in world competition.

Moreover, as more and more traditional and emerging manufacturing and service firms seek business success in the global information economy, the need for continued adaptation and readaptation to changing opportunities in the external business environment will, in turn, result in major modifications in the internal structures and functions of business units. The functional strategies that firms adopt for managing information resources will have to be in tune with, and appropriately support, redefinitions of corporate and strategic business unit strategies. ■

Types of collaborative ventures

Type	Purpose	Example
Equity investment	Ensure supplier viability; establish an informal working relationship and exchange of technology	General Motors Corp.'s acquisition of Electronic Data Systems Corp.
Research and development ventures	Share costs and results of basic research and development	Microelectronics & Computer Technology Corp.
Cooperative ventures	Undertake a specific enterprise that does not entail creation of a separate operating company	Communications Satellite Corp. and Holiday Inns, Inc.
Operating ventures	Establish a stand-alone operating company — a "new business"	Satellite Business Systems (IBM and Aetna Insurance Co.)

VIEWCOM

Automatic Report Management And Distribution System

VIEWCOM ONLINE REPORT DISTRIBUTION SYSTEM MULTI FUNCTION MENU

```

S ID   DATE   TIME   LINES PAGE FORM CPY RTE DESCRIPTION
PK 001 01/07/86 14:05 000013 0004 STND 01 01 BACK ORDERS UPDATE
002 03/08/86 07:24 000014 0014 STND 01 00 GENERAL LEDGER
V 003 04/13/86 04:37 000023 0026 STND 00 01 ACCT PAYABLE
004 07/18/86 07:48 000035 0031 STND 01 00 CHECK REGISTER
P 005 08/08/86 08:28 000043 0037 STND 01 00 EMPLOYEE UPDATE
E 001 FROM NYC-003 14:05 000056 0051 STND 01 00 STDCK HOLDINGS
BENEFITS REPORTS

V=>VIEW P=>PRINT PK=>PRINT+KEEP PO=>PRINT+OPTIONS R=>ROUTE
OPIO=>ALL ROUTE TO: E=>ERASE
START PAGE: PAGES: KEEP AFTER PRINT Y/N PRINT ALL THIS FORM Y/N
PRINTER ID OVERRIDE
PF8=>SCROLL FWD PF7=>SCROLL BWD PF3=>QUIT PF2=>UTILITY
CLEAR=>REFRESH

```

VIEWCOM ONLINE REPORT DISTRIBUTION SYSTEM UTILITY MENU

```

1->UTILITY==>
F=>DISPLAY/ALTER FORMS ON PRINTERS M=>MODIFY ACTIVE PRINTER
B=>ROUTE REPORT TO BATCH OR RJE P=>PURGE REPORTS BY AGE
A=>ALIGNMENT FORMS PATTERN GENERATION C=>DISPLAY FORMS CONTROL IMAGE
R=>ROUTE REPORT TO ANOTHER REGION

MSG: COPIES: AUTOMATIC PRINT ALIGNMENT Y/N:
FORMS IO: PRINTER FUNCTION: PAGES:
PRINTER IO: B=>BACK SPACE F=>FORWARD SPACE
S=>STOP AFTER PRINTING H=>HALT IMMEDIATE
REPORT IO: OPID: OUTPUT CLASS: RJE STATION IO:
JOBNAME: REGION NAME:

DELETE REPORTS WHICH ARE "N" DAYS OLD, ENTER NUMBER OF DAYS:
RETAIN REPORTS IN HOLD STATUS Y/N: Y
PF3=>QUIT CLEAR=>REFRESH PF2=>MULTI-FUNCTION MENU

```

- Multi-Function Menu Gets You There Faster
- On-Line Report Viewing Saves Paper
- PC Support Puts PCs To Work
- Automatic Routing Speeds Report Distribution

Without
VIEWCOM

SAVE
75%

With
VIEWCOM



StarTech Software Systems Inc.
25-15 50th Street, Woodside, New York 11377 (718) 204-2119

CW5 26

NAME _____ TITLE _____
 COMPANY _____ ADDRESS _____
 CITY _____ STATE _____ ZIP _____
 PHONE _____ IBM OPERATING SYSTEM _____

NEW PRODUCTS

Powerbase performance enhanced

Powerbase Systems, Inc. of Birmingham, Mich., has released a new version of its \$349 Powerbase menu-driven, relational data base package, which reportedly is 21% faster and provides more file room than the previous version.

Much of the increase in performance is because of changes in the structure of the .KEY files, which allow the package to accommodate up to 288% more records in a file with multiple indexed fields. Changes to the .KEY files also save disk space when large files are used. A data base with seven files, 1,260 records and six indexed fields requires 105,984 bytes in Version 2.2., compared with 262,656 bytes in the previous version. However, files with few records may require more disk space.

In addition, Powerbase now has the ability to exchange Powerbase data with data from Wordperfect Corp.'s Wordperfect secondary files to perform merges. Powerbase was already able to exchange files with such popular packages as Lotus Development Corp.'s 1-2-3 and Ashton-Tate's Dbase II and Multimate software. Also, Powerbase's in-load and out-load features are now compatible with Lotus 1-2-3, Version 2.

Other enhancements include the ability to take advantage of the Intel Corp. 8087 and 80287 math coprocessors and additional support for random-access memory (RAM)-resident macro software such as Prokey by Rossoft, Inc. and Superkey by Borland International, Inc.

Users covered by the Powerbase 2.1 maintenance agreements automatically receive a free upgrade. Other users can upgrade for \$25. Users of Powerbase versions 1, 1.1, 2, and 2.01 can order a new manual and Version 2.2 disks for \$75.

Powerbase runs on the IBM Personal Computer, Personal Computer XT, AT and 3270 Personal Computer as well as compatible computers. The package requires 320K bytes of RAM and Microsoft Corp. MS-DOS or IBM PC-DOS 2 or higher. Site licenses are available from Powerbase.

PC-based microfilm tool out

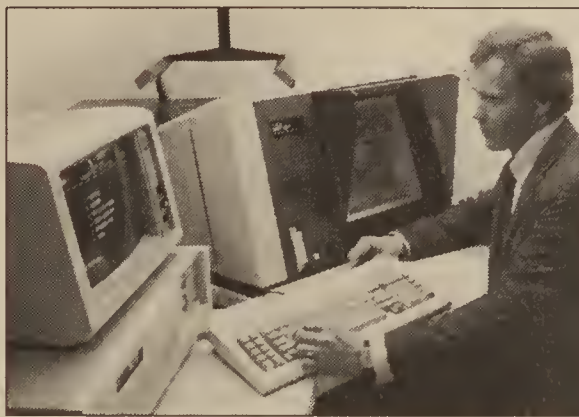
Kodak system captures, retrieves document images

The Eastman Kodak Co. of Rochester, N.Y., has announced the Kodak KAR-1500 PC information system, a microcomputer-based system used to capture and retrieve documents on microfilm.

While document images are being captured by the RV-3 camera, the operator keys in descriptive information, creating the index that is later employed for retrieval. Up to three levels of indexing are supported. The simultaneous operation eliminates the need for postprocessing indexing. Faster rotary cameras can also be used with the KAR-1500 PC system, although indexing must be done separately afterwards.

To retrieve a file, the operator keys the known descriptive information into the microcomputer. The software searches the disk and displays a list of the microfilm magazines that contain the information requested. After the proper magazine is inserted into the retrieval terminal, the operator commands the retrieval unit to advance to the requested frame. A print-out of the document then can be made.

A basic KAR-1500 PC system costs about \$30,000 and includes an IBM Personal Computer AT with a 30M-byte hard disk and computer-aided retrieval (CAR) soft-



The Kodak KAR-1500 PC supports up to three levels of microfilm indexing.

ware (\$14,000), a Kodak Starfile RV-3 camera for document capture (\$6,000) and a Kodak IMT-50 microimage terminal for retrieving, viewing and printing documents (about \$10,000).

The setup also includes the new Kodak Starfile CAR copy-board accessory, which links the microfilm camera to the personal computers. The copy board is used to place the sequence numbers and other identifying marks sent from the micro onto the microfilm when it is indexed.

The KAR-1500 PC software is sold separately for about \$9,000 and requires about 3M bytes of overhead on the hard disk. The CAR software requires a minimum 10M bytes and will run on an IBM Personal Computer XT and compatibles. The other components also are available separately.

Portable word processor debuts

Quadram Corp. of Atlanta has unveiled the Keystyle 80, a portable word processing system that consists of a laptop intelligent keyboard, and the Writestyle, a portable letter-quality printer.

The 3-lb Keystyle 80 is said to feature read-only memory-based word processing software, telecommunications software and calculator, calendar and clock functions. It also features an 8-line by 80-char. pop-up screen.

The Keystyle can also be used as a keyboard for Quadram's Datavue series of portable IBM Personal Computer-compati-

bles via an infrared link. Optional cables allow the Keystyle to be used as a keyboard for IBM Personal Computers and compatibles. Files can be transferred to a PC or compatible via the RS-232C port.

The 6-lb Writestyle is said to use a direct impact tub-style printwheel with a print speed of 14 char./sec., bidirectional. It can be used with the Keystyle, or as a printer for Datavue and IBM Personal Computers and compatibles via centronics parallel and RS-232C serial interfaces.

The Keystyle and the Writestyle retail for \$349 each or \$599 together.

Sony MVR-5500 still video recorder offers floppy disk alternative to slides

Sony Corp. of America, located in New York, has introduced the Promavica Still Video Recorder MVR-5500, a frame storage device designed as an alternative to slides.

The system is said to record still video pictures on a Mavipak disk. The Mavipak is a 2-in. magnetic video floppy disk that is virtually identical in size to a 35mm slide mount. According to Sony, the disk can record 50 fields of pictures or 25 frames with double the vertical resolution and with 360 lines of horizontal resolution. The disk uses an identification code of up to six digits for each image. The MVR-5500 can access from one image to another anywhere on the disk within 2 sec., Sony stated.

The MVR-5500 is said to be com-

patible with virtually all composite video and analog/digital red-green-blue (RGB) signals from cameras, video tape recorders, videodisks, television tuners and computers. Its composite video and analog RGB outputs allow it to be used with video projectors, monitors and video printers. It also features the ability to synchronize with audio recorders.

The recorder/player has an RS-232C port as well as two six-pin remote control ports for the Program Edit Controller, the RM-E5500.

The Promavica system is priced as follows: MVR-5500 Still Video Recorder, \$3,400; RM-E5500 Program Editing Controller, \$1,200; RM-52 Remote Control Unit, \$150; and 10 MP-50 Video Floppy disks, \$100.

Upgraded Tandy micro bows

High-end 3000 gets added storage, RAM

Tandy Corp. of Fort Worth, Texas, has announced a new \$4,499 version of its Tandy 3000 IBM Personal Computer AT-compatible computer featuring a 35M-byte hard disk drive.

According to a company spokesman, the Tandy 3000 35 MB HD computer offers 5M bytes more storage, greater memory expansion capability and a standard 640K bytes of random-access memory (RAM) — 128K bytes more RAM — than the newest IBM PC AT.

The Tandy 3000 35 MB HD comes with one 1.2M-byte floppy disk drive and a standard 640K bytes of memory, which can be expanded to 12M

bytes under the soon-to-be-available Xenix operating system, Tandy said.

The previous high-end Tandy IBM PC-compatible computer was the Tandy 3000, introduced last November. That machine will continue to be offered with 512K bytes of memory and a 1.2M-byte floppy disk drive for \$2,599. A 20M-byte hard disk version will continue to sell for \$3,599.

The Tandy 3000 computer uses the Intel Corp. 80286 microprocessor and operates at 8 MHz. The Tandy 3000 Deluxe Graphics Adapter displays the standard IBM Color Graphics Adapter mode as well as additional modes.

Standard features include a real-time clock with battery backup, a serial and parallel adapter, a keyboard and a provision for an optional math coprocessor.

INSIDE

Software
& Services/86

Microcomputers/94

Communications/102

Systems
& Peripherals/105

Price
Reductions/107

NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE
& SERVICES

Systems software

IPT Corp. has introduced **F68K** and **C68K**, software products said to facilitate multiprogrammer Fortran and C code development on Digital Equipment Corp. VAX and Data General Corp. MV and Eclipse systems.

Each system includes a compiler, assembler, linker and librarian. Also included are IPT's source-level debuggers, Fortran-lint and, for C, Lint-Plus. Both debuggers are said to analyze all the modules in a program simultaneously and output operator-selectable levels of comment about the code.

F68K and C68K cost \$9,500. Both Fortran-lint and Lint-Plus are avail-

able as stand-alone tools for \$4,500.

IPT, 1096 E. Meadow Circle, Palo Alto, Calif. 94303.

Swanson Analysis Systems, Inc. has ported its finite element analysis program, **Ansys**, to Digital Equipment Corp.'s Vaxstation II/GPX and VMS operating systems.

Ansys is said to integrate preprocessing, solution, postprocessing and color graphics. It is said to be able to generate two- and three-dimensional, hidden-line or section plots and offer options such as multiple windows, zoom and perspective. A solid modeling module facilitates design visualization and optimization.

Ansys on the Vaxstation II/GPX is licensed on a monthly basis ranging from \$1,500 to \$21,000, depending on

the number of users.

Swanson Analysis Systems, P.O. Box 65, Johnson Road, Houston, Pa. 15342.

Pansophic Systems, Inc. has announced **Telon 1.4**, an enhanced version of its application development productivity system for IMS-DC and CICS environments.

Telon has three integrated software components: the Telon design facility, the application system generator and the modeling and testing facility. Enhancements include prototyping, modeling without compiles, panel presentation stores and automated user documentation.

A Telon 1.4 perpetual license ranges in cost from \$130,000 to \$285,000. After the first year, main-

tenance costs 12% of the purchase price per year.

Pansophic, 709 Enterprise Drive, Oak Brook, Ill. 60521.

4D Software Ltd. has announced **Control-M**, a production control software system for IBM mainframe computers.

According to a company spokesman, Control-M features real-time release and contention elimination as well as the ability to dynamically handle the reallocation of resources between multiple CPUs.

Other features include job dependency definition, user notification, job recovery, dynamic print disposition, autoedit setup of IBM's JCL and reporting.

Control-M is priced at \$42,000.

4D Software, 4 Browning Lane, Hartsdale, N.Y. 10530.

Applications packages

AGS Management Systems, Inc. has announced **Release 5.3** of its **PAC II** project management system.

Release 5.3 reportedly features new user and technical documentation, new entry screens, improved system menus and prompts, increased flexibility and power in tracking and retrieving resource information, increased security and increased flexibility in scheduling and tracking milestones.

The PAC II system runs on large- and medium-scale IBM, Digital Equipment Corp., Honeywell, Inc., Prime Computer, Inc., Burroughs Corp. and Sperry Corp. Univac computers.

PAC II Release 5.3 is priced starting at \$44,000.

AGS Management Systems, 880 First Ave., King of Prussia, Pa. 19406.

Utilities

Professional Computer Resources, Inc. has announced **RMS Comparesource**, a software utility designed to simplify installation of the vendor's RMS/38 applications software.

RMS/38 is a resource management system designed to run on the IBM System/38. RMS Comparesource is said to be implemented as a System/38 command. The product is said to provide validation of input parameters with compatible data presentation.

Users can include or exclude all forms of comments, print an exception list or a complete list with exceptions noted, include the change date of each source line and hold or print the output, according to Professional Computer Resources.

RMS Comparesource is priced at \$2,750.

Professional Computer Resources, Two Mode America Plaza, Oak Brook Terrace, Ill. 60181.

Relational Database Systems, Inc. has announced that its **Informix ESQL/Cobol** software is now available for Ryan-McFarland Corp.'s RM/Cobol compilers.

According to the vendor, Informix ESQL/Cobol will enable RM/Cobol application programmers to access the Informix-SQL relational data base via SQL commands embedded in

Continued on page 90

ON JULY 9, WE FOCUS
ON SOFTWARE.

The market for software is simply going wild. With new applications. New technologies. New ideas. And MIS/DP professionals are the ones who have to deal with it all.

The key is making different software work together. Not just applications software, but operating software, too.

Our July 9 issue will address the latest in software from DBMS to decision support systems to fourth generation languages and the role each plays in integrated systems.

Then we'll zero in on productivity.

Our July special section also tackles one of the biggest software issues. Productivity.

We'll start with a look at the popular and innovative products that are the driving force behind most hardware today. We'll update readers on the continuing evolution of 4GLs, DBMS systems and more. We'll check out new and developing tools for system productivity. And, finally, we'll ask MIS professionals how they're planning to implement all these new products and technologies.

Reach the people you really want.

We'll be reaching precisely the people you want to reach. 129,000 paid Computerworld subscribers. Plus thousands of pass-along readers. Plus attendees at PC Expo and Software Expo. If you're involved in software marketing, you couldn't ask for a more qualified audience of decision makers.

We'll even be providing you with a free Starch study for qualifying advertisements. Which can help you determine if your advertising is as effective as your media buy.

Reach your audience effectively — and efficiently — in July's Software Focus.

But hurry, closing is May 30. For more information, contact Ed Marecki, Vice/President Sales, Computerworld Focus, 375 Cochituate Rd., Framingham, MA 01701-9172, (617) 879-0700. Or call your local Computerworld sales representative.

Issue: July 9 - Closing: May 30

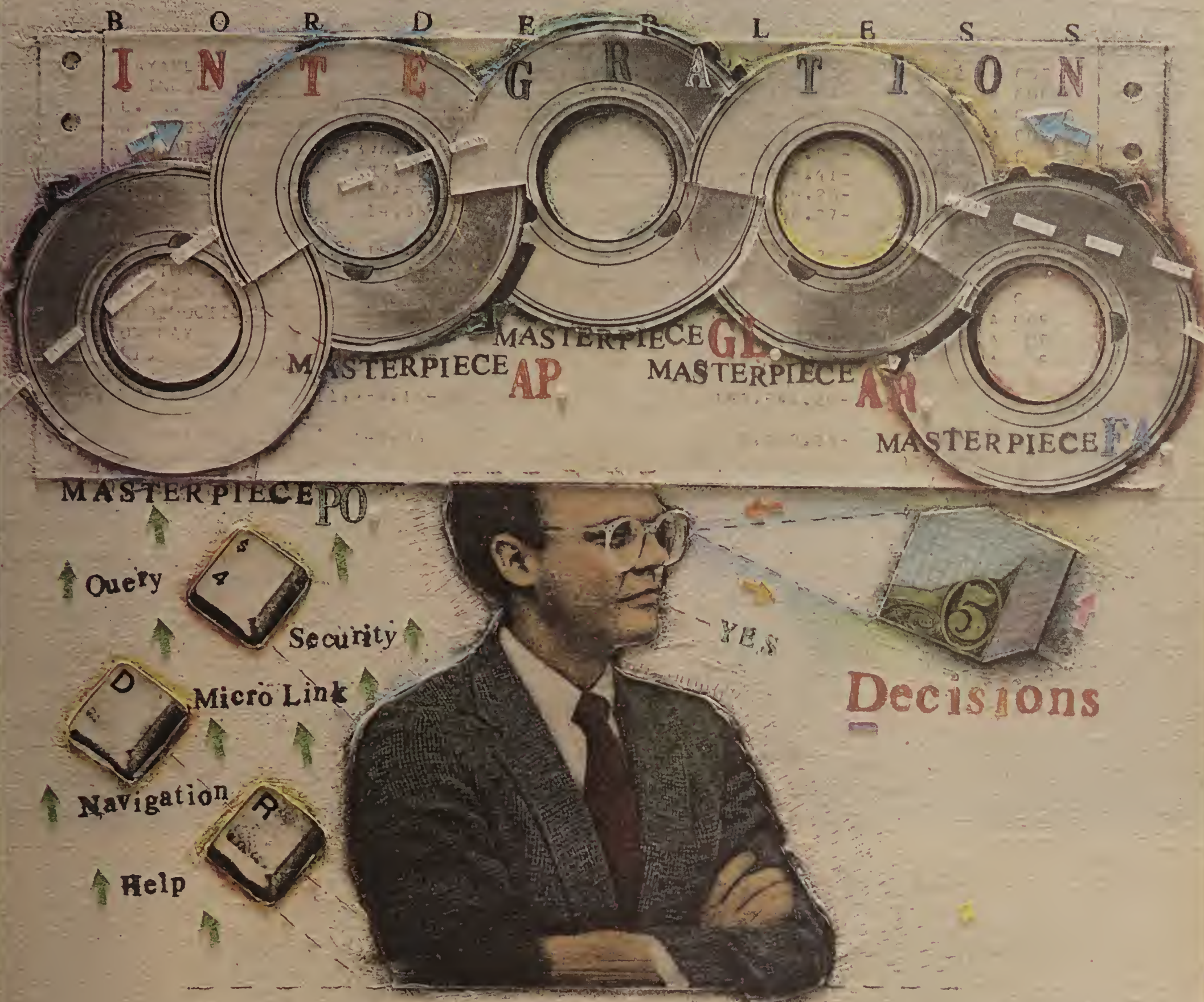
COMPUTERWORLD
FOCUS

We put the hottest issues of the day in focus.

A PUBLICATION OF
CW COMMUNICATIONS

SALES OFFICES: Boston: (617) 879-0700/New York: (201) 967-1350/Atlanta: (404) 394-0758/Chicago: (312) 827-4433/Dallas: (214) 991-8366/
San Francisco: (415) 421-7330/Los Angeles: (714) 261-1230

ONLY A MASTERPIECE OF FINANCIAL SOFTWARE CAN INTEGRATE THESE APPLICATIONS ON YOUR IBM MAINFRAME, DEC VAX OR IBM SYSTEM/38.



Being able to immediately integrate all of your company's financial information is a tremendous advantage to sound corporate decision making.

To selectively consolidate corporate-wide reports. To combine data from accounts payable and accounts receivable with purchase orders, general ledger and fixed assets anytime, any day.

The Masterpiece® Series does this for you.

It's the only complete portfolio of financial software with full integration features for your IBM mainframe, DEC VAX and IBM System/38—native to each environment. As such, it gives major corporations uniform financial reporting, even from multiple-machine environments.

You'll find Masterpiece to be faster, more powerful and more intelligently designed than any other financial software.

Faster, because information access is enhanced by "borderless" integrated applications. All applications share the same familiar English-like commands and screen prompts, so they're easy to learn and quick to use.

More powerful, because Masterpiece includes a unique query and reporting system that gives even the occasional user a comprehensive tool to instantly

retrieve information in virtually any report format. Yet, MasterSecurity™ provides an advanced safeguard against unauthorized access.

And more intelligent, because its efficient, modular design lowers DP/MIS maintenance and raises user productivity while expanding your future options.

Call or write for a copy of our 40-page brochure on how to integrate all of your financial information while gaining the security of doing business with General Electric's Software International—providing support for thousands of IBM mainframe, DEC VAX and IBM System/38 users from 30 offices worldwide.

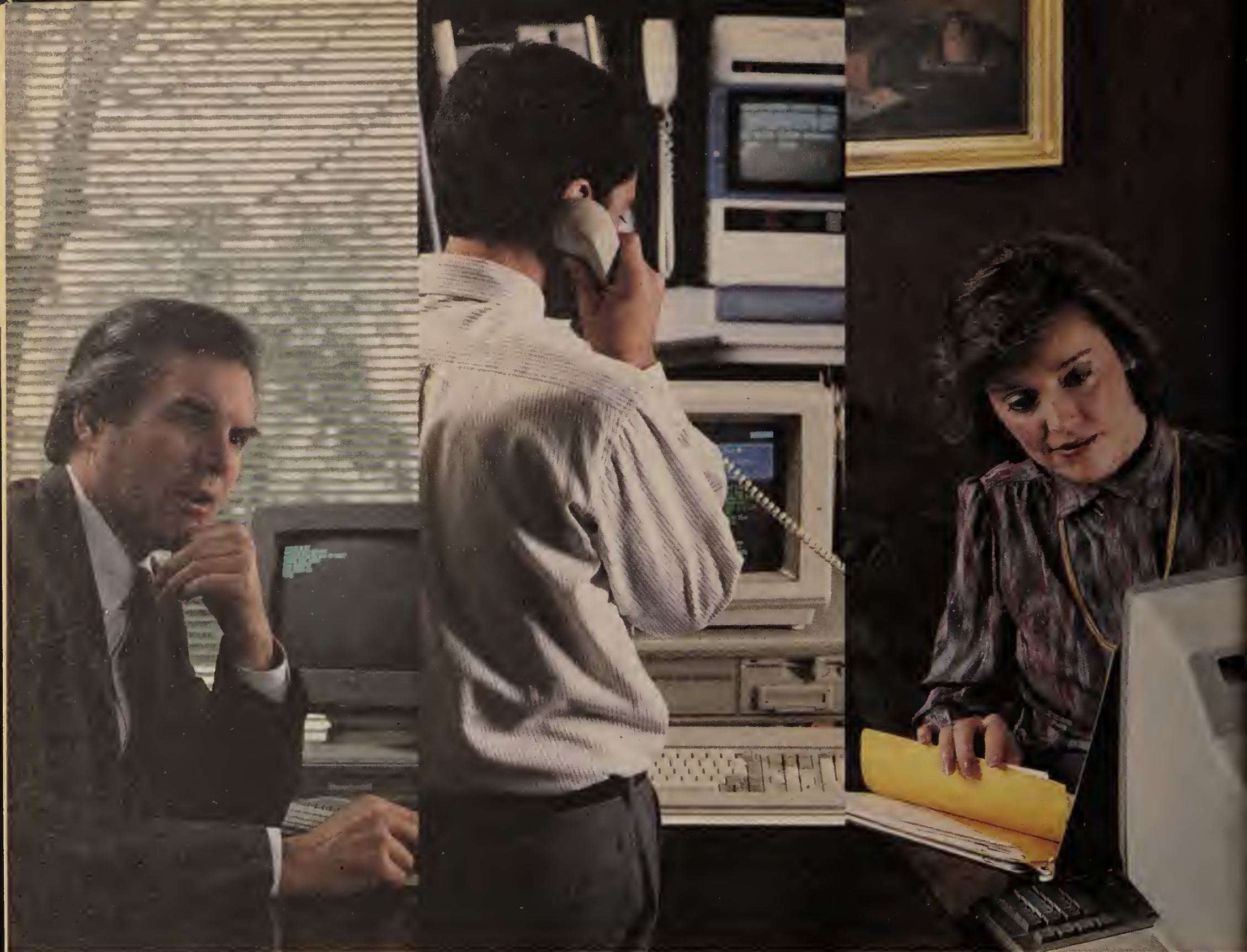
1-800-343-4133 (In Massachusetts 1-800-322-0491)
One Tech Drive, Andover, MA 01810-2497

Masterpiece and MasterSecurity are trademarks of Software International Corporation. IBM is a registered trademark of International Business Machines Corporation. DEC and VAX are registered trademarks of Digital Equipment Corporation.



**SOFTWARE
INTERNATIONAL**

masterpiece®



So the DP Manager said,
“Every day I face the challenge
of making people more productive
while controlling costs.”



And we said, “It’s simple with MAGNA 8.”

The multiple personalities of MAGNA 8* help you face the needs of programmers and non-technical users alike—while you control costs.

MAGNA 8 is fourth-generation software from Honeywell that can dramatically improve programmer productivity, while making your computer more accessible to knowledge workers throughout your organization.

With MAGNA 8, you can use a single product for data management; prototyping, application and code generation, report writing, and ad hoc queries. All

this from an advanced language that’s easy to use.

With this one 4GL to meet diverse needs, you not only can save the cost of multiple products, you can save multiple training and support costs.

And because it’s for Honeywell GCOS 8 large systems, MAGNA 8 is backed by a tradition for excellence, and a superior worldwide service network.

For more information on this exciting fourth-generation language, call 1-800-328-5111, ext. 2773 or write Honeywell Inquiry Center, MS440, 200 Smith Street, Waltham, MA 02154.

Together, we can find the answers.

Honeywell

*MAGNA 8 is a registered trademark of MAGNA Business Systems Corporation.

NEW PRODUCTS/SOFTWARE & SERVICES

Continued from page 86
their programs.

The programs are said to pass through a compiler to convert SQL statements to Cobol, and the compiled Cobol code can interface with the relational data base.

Informix ESQL/Cobol for RM/Cobol compilers is priced from \$595 on a personal computer to \$36,000 on an IBM mainframe.

Relational Database Systems, 4100 Bohannon Drive, Menlo Park, Calif. 94025.

Fusion Products International, Inc. has added a table creation feature to **Fusion/36**.

Fusion/36 is a report writer and file manager package for the IBM System/36. The table creation feature is a data base tool enabling users to design an inquiry. Tables divide records from up to eight files into categories and then analyze field data in each category. A single table can hold up to 100 categories. A table can present a three-

dimensional summary of a data base in one pass.

Fusion/36 with the table creation feature costs \$3,600.

Fusion Products International, Suite 300, 4000 Civic Center Drive, San Rafael, Calif. 94903.

Global Software, Inc. has announced **Vista**, an information retrieval product for IBM mainframe and mini-

computer systems.

Vista is said to be an on-line, menu-driven system offering query and report writing facilities.

Features include password security, access to information across various applications and customized ad hoc or recurring reports and queries.

Vista is packaged to enable users to access specific applications or multiple application data files, including non-Global products.

Vista is priced from \$25,000 to \$60,000.

Global Software, 1009 Spring Forest Road, Raleigh, N.C. 27609.

Data base management systems

Unify Corp. has ported its **Unify Relational Data Base Management System** to the IBM RT Personal Computer.

According to the vendor, Unify DBMS was designed for high-volume transaction-oriented applications in commercial environments and for scientific and real-time applications. It features high-performance multiple access methods and the capacity for storage of more than two billion records.

A development license for Unify DBMS on the IBM RT PC costs \$1,995. One runtime license costs 50% of the development license price with quantity discounts available.

Unify, 4000 Kruse Way Place, Lake Oswego, Ore. 97034.

Training software

LS/Werner & Associates has announced the **Alvey Expert Systems Starter Pack**, said to be an expert systems educational product.

The pack provides an interactive, self-contained method in which to learn about expert systems. It consists of five modules: versions of four expert system software tools and a user guide.

According to the vendor, the four tools are set in context by presenting such topics as the issues surrounding the development of successful expert systems, expert systems methodology, introduction to and analysis of the four tools and a list of consultants to contact for further guidance.

The Starter Pack costs \$1,995.

LS/Werner & Associates, Suite 331, 1433 Santa Monica Blvd., Santa Monica, Calif. 90404.

Deltak, Inc. has unveiled its **Training Management System** for the IBM Personal Computer XT or AT.

The menu-driven, on-line interactive system is written in Ashton-Tate's Dbase III and features curriculum planning and comprehensive reporting. It also includes color monitor capabilities.

According to the vendor, the Training Management System was designed to establish training plans for learner-paced instruction and lecture classes, track individual training plans, summarize the results and generate management reports.

The system is reportedly available to Deltak customers through their rental

Continued on page 94

WHEN IT COMES TO BUILDING WIDE-AREA NETWORKS, THERE'S NO SUBSTITUTE FOR EXPERIENCE.

While any number of companies can offer to sell you a private wide-area network, one company can offer you 25 years of computer and communications experience along with it. BBN Communications.

Experience that includes designing and building the world's first packet-switching network for the U.S. government back in 1969. Since then, it has evolved into the world's largest wide-area network, the Defense Data Network, connecting over 30,000 users throughout the world.

But the U.S. Government isn't the only customer with tough networking problems that BBN has helped to solve. Numerous major corporations, among them Wang, Weyerhaeuser, and MasterCard, not to mention European giants like England's National Westminster Bank and Italy's largest corporation, ENI, have also found the answers they were looking for from us. Each came to BBN with a unique networking problem—from integrated voice/data transmission to electronic mail to credit authorization—and each came away with a unique networking solution.

If you're going to make a major commitment to a wide-area network vendor, only three things count. Experience, experience, and experience. In wide-area networking only one company delivers it all.

SHOULDN'T YOU BE TALKING TO BBN?

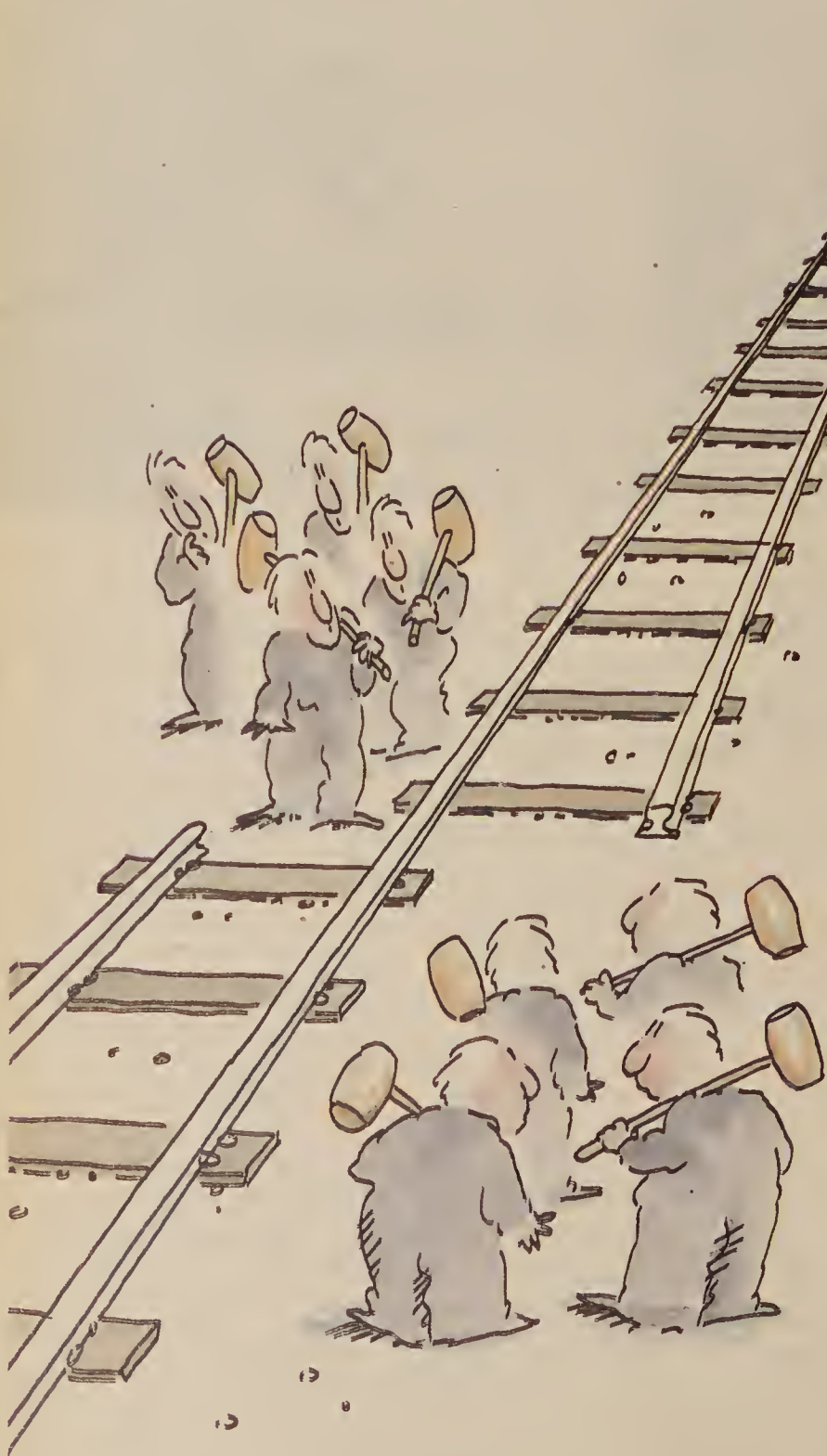
BBN Communications

A Subsidiary of Bolt Beranek and Newman Inc.

70 Fawcett Street, Cambridge, MA 02238
Telephone 617-497-3268 Telex 921470



Visit Us At ICA Show Booth #1244



Why is MODEL 204 the pacemaker for handling larger databases?

Heartbeat response.

When it comes to fast response to queries and updates, there's no database too large for Computer Corporation of America's MODEL 204.

In fact, against the competition, the bigger the database, the better we look. Here's an example:

A large travel agency with 900-plus on-line terminals uses MODEL 204 to maintain information on accommodations and transportation options around the world. In a benchmark simulating 1,000 users, 1,920 complex transactions were made in one minute on the travel agency's 2-gigabyte database. Response time? An average of 1.1 seconds.

The simple fact is, there is no relational-based DBMS that can store more, or handle it faster than MODEL 204, no matter how complex your queries get.

Like one large direct marketing firm that uses MODEL 204 for on-line real time sales tracking and analysis.

Their 10-gigabyte database contains 4,000 fields, of which 3,000 are keyed. Average response time to extremely complex queries of 3,000 or more transactions per minute? Less than 10 seconds. For less complex queries, response time drops to less than 2 seconds.

Heartbeat response. Another way of saying MODEL 204.

Get the facts. Write John Donnelly, V.P. Marketing, Computer Corporation of America, Four Cambridge Center, Cambridge, MA 02142. Or, call 1-800-258-4100, extension 603.

**Computer Corporation
of America**



A Crowntek Company

Software innovators creating better ways to manage business.

Talk
is Cheap.

It's
Performance
That
Counts.

Today's system software buying decisions will affect your company for years to come.

Before you select a vendor, talk to people you can trust.

If you're about to invest in system software for your mainframe, here's some free advice that may surprise you:

Go slowly.

The decision you're making will be felt for years to come throughout your entire organization. So don't try to short-cut the selection process.

And in particular, don't make a decision without talking to people with first-hand experience — the users of the products in question.

Naturally, we believe that Software AG products offer the best solutions available to the problems you face. And we'd like to have an opportunity to convince you — not by competitive claims and counterclaims, but by demonstrated performance in real-world customer sites.

In the meantime, we'd like to offer a few thoughts on some factors that contribute to performance.

Needed: integrated, long-term, worldwide solutions.

If you've been involved in data processing for any length of time, you already know more than enough about the dangers of piecemeal "quick fixes". You don't have to be sold on the value of integrated tools that meet a full range of organizational needs through a common syntax and shared procedures.

But while many vendors preach integration, few practice it on the scale of Software AG. From our core products, ADABAS and NATURAL, we have created an entire universe of software products that simultaneously meet the needs of everyone from MIS professionals to end users with no programming experience.

We're also integrated in another way — geographically. As more and more organizations seek to coordinate resources and data on a worldwide basis, they need a caliber of support that is consistent worldwide. Software AG's reach is unique among independent software vendors — with products installed in 52 countries.

Fourth-generation technology: Who needs it? Who's got it?

A lot of vendors have expended a lot of hot air on the subject of fourth-generation languages. And we'd be the last to deny that a well-designed 4GL like NATURAL can be a phenomenal productivity tool — as much as 10 to 20 times more productive than COBOL, for instance.

But the language itself is only part of the story. Because in committing to a fourth generation system, you're really committing to an entire technology for meeting your organization's needs. You'd better be sure that technology

includes everything you need — from DBMS, 4GL, and data dictionary to end-user computing tools, office systems, micro/mainframe links, and intersystem communication facilities. If it doesn't, you may be looking at only a partial solution.

In any case, don't evaluate a 4GL by itself. Evaluate it in relation to the other products that are required to satisfy your total information needs. Do they share a common architecture or syntax? Were they designed together, or are they simply marketed together? And most important of all, how do people like working with them?

We *know* how people like working with NATURAL. After all, it's the world's most widely installed, widely experienced fourth-generation language — used by over 75,000 programmers. If you're looking for insights into 4GL technology, you might start by talking with one of them.

Industry surveys repeatedly rate Software AG #1.

It's one thing for a vendor to be proud of its products. It's another for an entire industry to share in that high regard.

Yet that's just what's been happening with Software AG products. For several years, *Datapro* and *Datamation* have both published annual surveys of system software users. And Software AG has repeatedly come out on top by a variety of yardsicks. That's not rhetoric — that's performance.

Software AG: high-performance vendor to over 2000 customers.

Because system software is a long-term investment for most organizations, it inevitably carries with it a long-term relationship with the software vendor.

And for many years, we and our users have recognized the importance of that relationship. In fact, we have worked together to shape it in the interests of delivering the best possible product performance.

But while we're glad our users take the trouble to respond to surveys, we have no control over their comments.

Which makes it all the more gratifying to see the survey results. And all the more imperative that you hear what users have to say — before you buy.

Just give us a call today. Or send in the coupon. We'll be glad to put you in touch with Software AG users in situations comparable to yours, so you can find out for yourself what industry insiders have known all along:

Anyone can talk. But when it comes to performance, Software AG stands alone.

Call us at 1-800-336-3761.
(In Virginia and Canada, call 1-703-860-5050.)

I'm tired of talk. Let me see some performance.

Name _____

Title _____

Company _____

Address _____

City _____ State _____

Zip _____ Phone _____

Current DP Environment _____

Software AG
11800 Sunrise Valley Drive, Reston, VA 22091 CW0526

 **SOFTWARE AG**
11800 Sunrise Valley Drive, Reston, VA 22091

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 90

agreements, or it can be purchased for \$1,100.

Deltak, East-West Technological Center, 1751 Diehl Road, Naperville, Ill. 60566.

MICROCOMPUTERS

Systems

Vision Research, Inc. has announced its **Desktop Page Composition System** for the IBM Personal Computer, Personal Computer XT, AT and compatibles.

According to the vendor, the system consists of a 300 dot/in. resolution input scanner, a Megabuffer interface board and Megascan image and text editing software.

The Composition System reported-

ly lets the user store electronic snapshots of printed or computer-generated material and edit them under computer control. The images can be documents, drawings, photos, line art or screen snapshots of other application programs.

The Desktop Page Composition System is priced at \$2,495.

Vision Research, Suite B-112, 1590 Old Oakland Road, San Jose, Calif. 95131.

Digital Vision, Inc. has introduced a version of its **Computereyes** video acquisition system for IBM Personal Computers and compatibles.

Computereyes is said to allow users to capture real-world images with any standard video source. According to the vendor, two acquisition

modes allow the capture of either high-contrast images or 16 gray-level images. On-board switching allows the video source signal to be previewed on the monitor.

The package includes interface adapter, complete software support on disk and manual. It costs \$249.95.

A system including a video camera is priced at \$529.95.

Digital Vision, Suite 2, 14 Oak St., Needham, Mass. 02192.

General Micro Systems has introduced **VK4010**, a hardware and software package said to enable an off-the-shelf personal computer to match the speed and graphics of a dedicated computer-aided design and manufacturing workstation.

Full keyboard and screen emula-

tion of Tektronix, Inc.'s 4010/14 graphics terminals is provided, as well as Digital Equipment Corp.'s VT series emulation.

Hardware includes a graphics controller, monochrome monitor and a character generator. The software features user-programmable soft keys and scripts and a DOS shell.

VK4010 costs \$2,295.

General Micro Systems, P.O. Box 5330, 9951 Valley View Road, Minneapolis, Minn. 55343.

Panasonic Industrial Co. has unveiled the **Business Partner**, an IBM Personal Computer-compatible desktop system.

The Business Partner is based on an Intel Corp. 16-bit 8086-2 microprocessor. It is user-switchable between 4.77 MHz and 7.16 MHz.

According to the vendor, the Business Partner offers six expansion slots and includes 256K bytes of random-access memory. Other features include Microsoft Corp. MS-DOS 3.1 and GW-Basic, a built-in parallel port and an IBM Personal Computer AT-style keyboard.

The \$1,295 model features a 5¼-in. 360K-byte floppy disk drive; the \$1,495 model incorporates two disk drives.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

Software applications packages

Realia, Inc. has announced **RealCICS**, said to allow development of CICS applications for either an IBM mainframe or Personal Computer.

The system includes the command-level Cobol program preprocessor that converts CICS command-level Cobol programs to a form that can be compiled by Realia Cobol.

The resource definition processor validates and converts CICS system macros to a form suitable for the Personal Computer. The Basic Mapping Support (BMS) macro processor produces the tables and Cobol copy members required for mapped screen use, and a map editor allows the interactive painting and generation of BMS maps.

RealCICS runs on the IBM family of Personal Computers. It costs \$995. Additional copies of the operating environment cost \$150.

Realia, 10 S. Riverside Plaza, Chicago, Ill. 60606.

Samna Corp. has announced **Samna Decision Graphics**, a graphic software package for IBM Personal Computers and compatibles.

According to the vendor, users can create graphs automatically from numerical and statistical data.

The software package is said to convert rows and columns of numbers into graphic forms and present input and calculations on the screen, on a plotter or on a printer. According to the vendor, there are 375 types of graphs available and 30 built-in calculations.

The software accepts data from a central computer, external files, information entered on the keyboard or old files.

Samna Decision Graphics costs \$450.

Samna, 2700 N.E. Expwy., Atlanta, Ga. 30345.

EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics set for June!

Executive Round Table (June 16) Five top executives discuss such key MIS/DP industry and business issues as: the two most important issues MIS/DP execs face in 1986; does next year's budget include more or less hardware or software purchasing; is management facing mostly technical or administrative issues? Also, expert thoughts on solving telecommunications problems and the proposed Burroughs-Sperry merger. Closing date May 30.

Personal Computer Graphics (Product Spotlight, June 23) How to evaluate and select PC graphics software for business presentations. Plus, graphics mainframe-to-micro links and a user survey. Closing date June 6.

Integrated Office Automation Systems (Executive Report, June 30) Current strategies of major vendors supplying integrated office systems. Established products, and newer ones that offer unique OA technologies like voice annotation and image technology. Determining user needs; the latest on network security. Closing date June 13.

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through July and August...

ISSUE	TOPIC	CLOSING DATE
July 7	Data Security (Executive Report)	June 20
July 14	Expert Systems (Product Spotlight)	June 27
July 21	PBX Networks (Executive Report)	July 3
July 28	Management Training for DP Executives (Executive Report)	July 11
August 4	Applications Generators (Product Spotlight)	July 18
August 11	Information Centers (Executive Report)	July 25
August 18	On End-user Computing (Executive Roundtable)	August 1
August 25	Image Processing (Product Spotlight)	August 8

Why not take advantage of these special opportunities to reach your customers? Executive Reports and Product Spotlights focus readers' attention — and that strengthens the power of your ads. Call Ed Marecki, Computerworld's Vice President/Sales at (617) 879-0700 — or call your local Computerworld representative — to reserve space for your ad today.

COMPUTERWORLD

Boston: (617) 879-0700 New York: (201) 967-1350
Atlanta: (404) 394-0758 Chicago: (312) 827-4433 Dallas: (214) 991-8366
San Francisco: (415) 421-7330 Los Angeles: (714) 261-1230

PRODUCT SPOTLIGHTS

Introducing NonStop VLX.™

Tandem technology sets the new standard
for large applications in on-line transaction processing.

More transactions per second
at a lower cost per transaction than any system in the world.

THE CIRCUITRY'S FAST.

We designed the system in our own laboratory, right down to our own unique VLSI chips. The result is more circuitry in less space. With fewer components than our next largest system, the VLX delivers twice the performance and three times the reliability.



PROCESSORS WITH LARGE APPETITES.

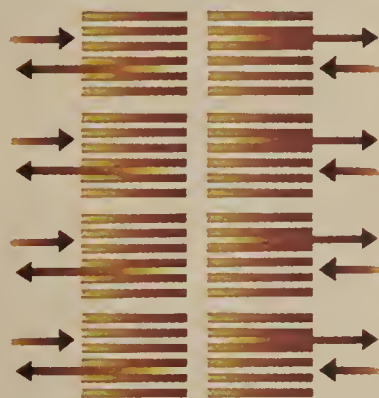
The VLX processors move transactions in 32-bit chunks. They reach into main memory in 64-bit chunks. Because this happens in parallel, more work gets done in less time at a lower cost per transaction.

THE SERVICE IS EASY.

All critical components are field replaceable. When service is required, it's faster. You don't even have to stop an operation to add or replace components.

THE DATA EXPRESSWAY.

In a conventional database, I/O requests must be handled sequentially. This creates queues that slow response time. In the VLX system, there are multiple paths to multiple disks. Data enters and leaves the database simultaneously. No time is wasted, and all disk space gets used.

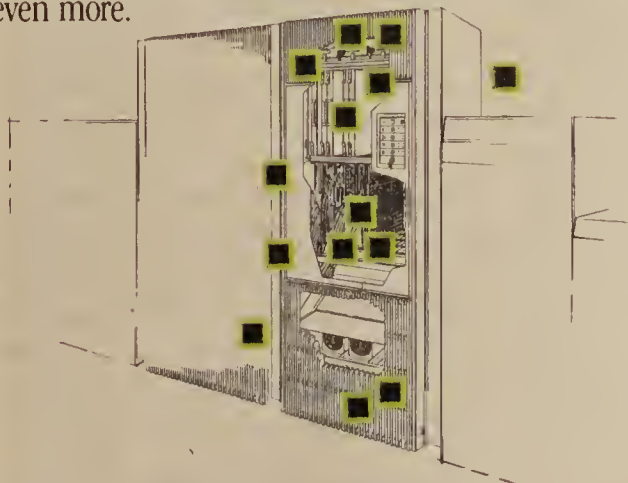


DIAGNOSTICS FROM A DISTANCE.

An integrated microprocessor allows us to monitor the system environment from anywhere in the world. We can even run stress tests remotely. If a failure does occur, the VLX has the capability to automatically dial out to remote centers anywhere in our worldwide network.

THE SYSTEM KNOWS THE SYMPTOMS.

Expert systems software, using fault analysis, directs the problem diagnosis systematically. It also allows us to analyze it and shorten service time even more.

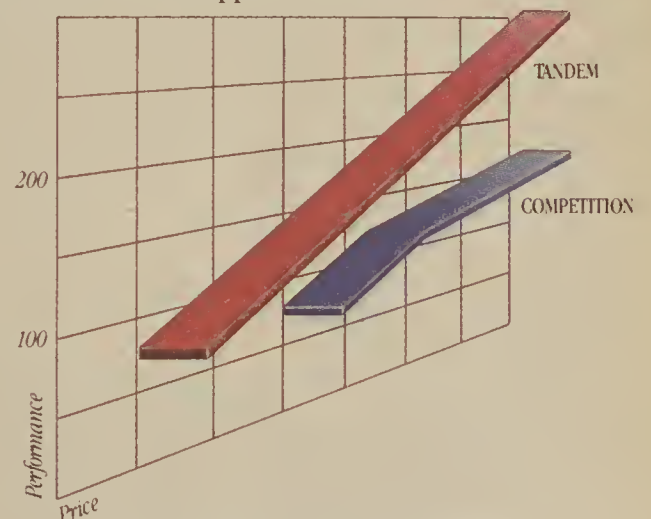


SECRETS ARE SAFE.

We offer software that will protect the security of your data whether it's in the VLX, in another Tandem system or in transmission.

NO GROWING PAINS.

To add power, just add processors. You can grow from a base four-processor system to 16. From there, you can expand in whatever increments you choose, all the way to 255 systems. You never buy more than you need, and you'll never have to rewrite a line of applications code.



NO-FAULT INSURANCE.

Tandem systems achieve fault-tolerance with a unique, parallel processing architecture. There are no idle back-up components. Instead, multiple components share the workload. If one goes down, the others pick up the slack, and application processing is uninterrupted.

HERE TODAY. HERE TOMORROW.

The VLX is compatible with any Tandem system and with all major communications standards — SNA, X.25, MAP and O.S.I. And by acting as a gateway to other vendors' systems, the VLX can link them and enhance their value as well.

WE HAVE EXCELLENT REFERENCES.

Tandem systems are already at work for Fortune 500 companies in banking, telecommunications, manufacturing, transportation, retailing and energy, as well as several branches of the U.S. Government.

To find out what we can do for you, call 800-482-6336 or write to us. Corporate Headquarters: Tandem Computers, Incorporated, 19191 Vallco Parkway, Loc. 4-31, Cupertino, CA 95014

 **TANDEM COMPUTERS**



THE ADVANTAGES OF HAVING THE PC

AT&T's PC 6300 PLUS: MULTI-TALENTED TO HANDLE MULTI-TASKS

Our newest PC displays a most distinct personality. It can do so many things and do them all extremely well.

Take, for instance, its uncommon speed. Unlike most other PCs, the PC 6300 PLUS works as fast as you do, so you never have to wait for it to catch up with you.

AT&T offers another clear-cut reason for selecting the PC 6300 PLUS: Its highly defined, easy-to-read screen resolution. Compared to the IBM PC AT*, the PC 6300

PLUS text and graphics are four times sharper. Whether you're working on sales charts or preparing presentations, getting a better picture helps communicate the big picture.

Our non-glare screen and tilt-and-swivel monitor allow you to work comfortably on the PC 6300 PLUS for hours at a time. Its sleek design enables this unusually powerful PC to fit easily on your desk. Again, next to all the major competitors, AT&T's PC takes up 40% less desk space.

PERSONALITY PLUS

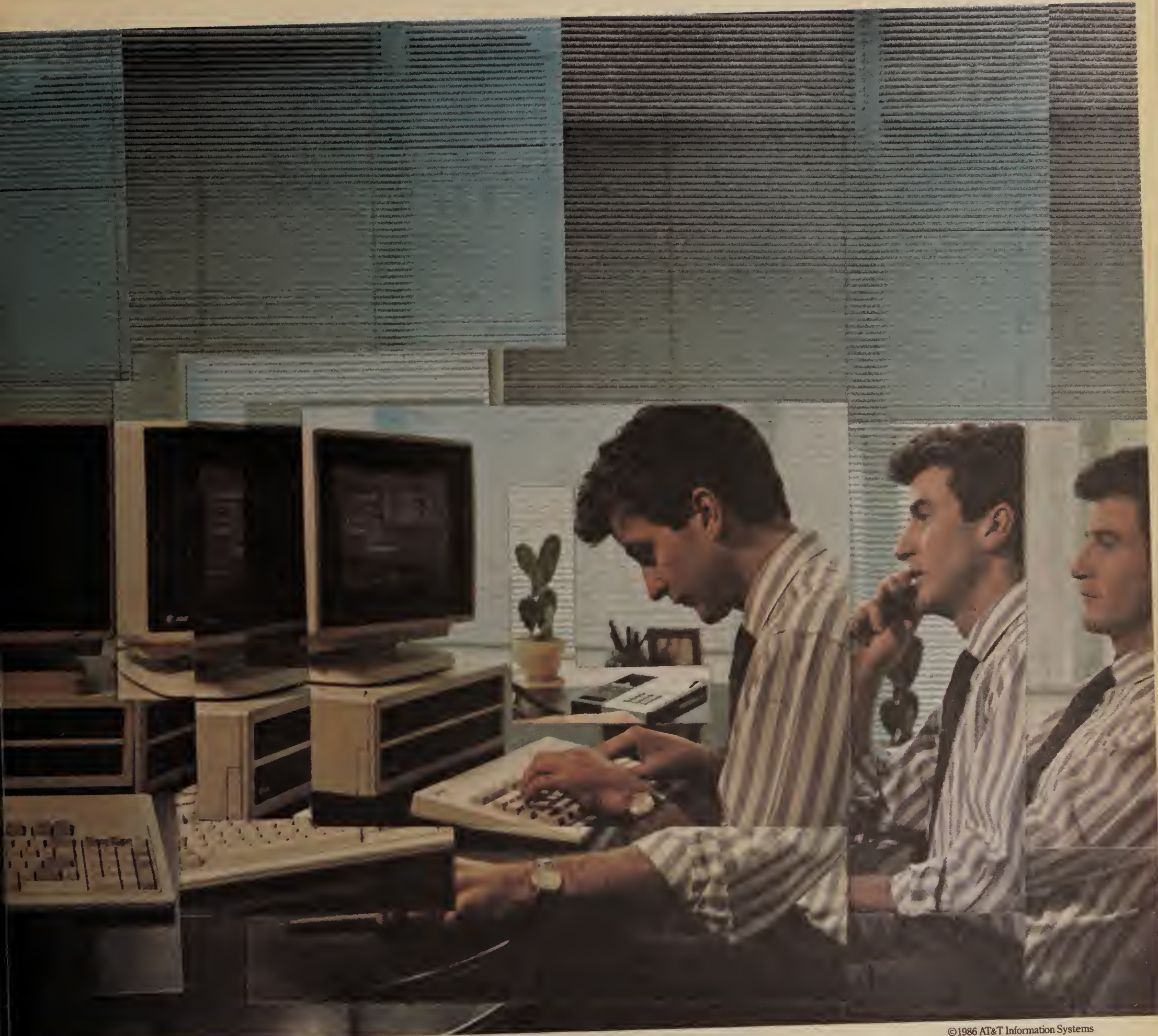
There's more to AT&T's PC 6300 PLUS

than sheer power and comfortable design.

There's a side no one's ever seen before. It's a special feature on the PC 6300 PLUS called Simul-Task which lets you do things on a desktop computer that other PCs only hope to do someday: it works the way you work.

Say, for example, you are working on a spreadsheet and need the latest stock quotes. Simul-Task enables you to call up the new information and return to your original program in a fraction of the time it would normally take. You'll soon be able to activate Simul-Task.

When you are ready to protect your work, the PC 6300 PLUS enables you to eas-



©1986 AT&T Information Systems

WITH THE MULTIPLE PERSONALITY.

ily make backup files while you continue on with other things. You can also schedule programs to run while you're away from your machine, so when you return, all the information will be waiting for you. The PC 6300 PLUS even affords you the convenience of sending and receiving electronic mail in the background while you run another program in the foreground.

THE COMPUTERS WITH THE FUTURE BUILT IN

The combination of high performance and unique features makes the AT&T PC 6300 PLUS the personification of PC invest-

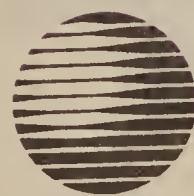
ment protection. Without abandoning the software you already own, you are bringing some extraordinary new capabilities to your desktop.

That's what you'd expect from AT&T, the one company whose computers are designed for the future.

All the more reason why the PC 6300 PLUS may very well be suited to your personality.

For more information call your AT&T Information Systems Account Executive, visit an authorized AT&T dealer or call 1 800 247-1212.

*IBM and AT are registered trademarks of International Business Machines Corp.



AT&T

The right choice.

The Automated Data Center. We have seen the future and this is it.



CA-UNICENTER™ Totally integrated.

Totally automated - all the systems software you need to solve every data processing problem.

Automating data center operations, and increasing programming productivity, CA-UNICENTER is a complete system modular in design to perform the following functions:

- Scheduling
- Tape and Disk File Management
- Security
- Performance Management
- Job Accounting
- Print Management & Distribution
- Systems Utilities
- Resource Management
- Cobol Code Optimization
- Program Testing & Debugging
- Quality Assurance
- Application Development & Report Generation



Software security — a product to meet every data processing need.

The way is CA



CA-UNICENTER™

Automating support and service, online and on demand 24 hours a day.

A built-in service and support system provides a hard-disk PC to link your main-frame to the Computer Associates' main-frame Customer Service System. You get immediate response to all requests and immediate solutions to all problems plus tutorials and HELP covering every CA-UNICENTER component.

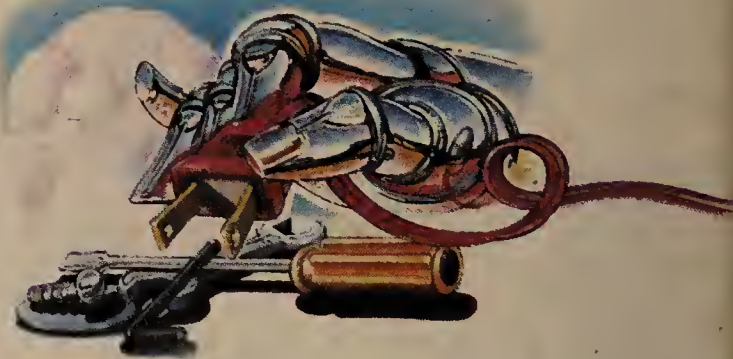


Relax and enjoy it — all the support and service you need automatically.

CA-UNICENTER™
Automated installation and continuous maintenance, too.

CA-UNICENTER also includes its own online, interactive, menu-driven installation and maintenance system. This user-friendly front end processor to IBM maintenance pro-

grams defines all product data sets, generates all required JCL and submits the job for execution...the easiest error-



Trouble free, worry free — everything's on automatic even installation and maintenance.

free installation you will ever experience. Maintenance is automated, too, with information and PTF's continuously available on tape or online through the Customer Service System.

Soon there will be just two kinds of data centers—those with CA-UNICENTER and those struggling without. We have seen the future, and can deliver it complete today. Call 800-645-3003 and ask for Dana Williams to show you the way to the future. The way is CA.



COMPUTER ASSOCIATES
Software superior by design.

711 Stewart Avenue,
Garden City, N.Y. 11530-4787

© 1986 Computer Associates International, Inc.

NEW PRODUCTS/MICROCOMPUTERS

Gessler Educational Software has announced two foreign language word processing programs, **Alexander** and **Gutenberg**.

Alexander has multilingual symbols for French, Spanish, German, Italian, Greek, Hebrew, Russian and English.

It is also equipped with the symbols used in science and math notation, music composition and electronic schematics.

Alexander runs on the IBM Personal Computer, AT&T Personal Computer 6300 and Compaq Computer, Inc. compatibles.

Gutenberg offers formats in 13 different languages. It runs on the Apple Computer, Inc. II+, IIe and IIfx, according to the vendor.

Alexander costs \$245. Gutenberg costs \$99.95.

Gessler Educational Software, 900 Broadway, New

York, N.Y. 10003.

Gessler Education Software has introduced **Passport**, **Prompt** and **Questionmaster**, three computer software authoring systems for foreign language curriculum use.

Passport was designed for creating courseware for learning French, Spanish, German, Russian, Hebrew, Japanese and 13 other languages.

It runs on the Apple Computer, Inc. II family.

Prompt is for lessons in English as a second language, French, German, Italian and Latin. It runs on the IBM Personal Computer and PCjr.

Questionmaster reportedly allows the teacher to construct interactive teaching and testing programs for learning French, German and

English as a second language.

It also runs on the Apple II family.

Prices for Passport, Prompt and Questionmaster are \$195, \$150 and \$69, respectively.

Gessler Educational Software, 900 Broadway, New York, N.Y. 10003.

Rainbow Software Systems has introduced **Client Plus**, a program said to help users manage client development and marketing activities.

The program is said to organize client profiles, sort personal contacts, track referral sources, target prospects, provide for follow-up letters, monitor weekly marketing activities, calendar events and create a library of articles and speeches.

Client Plus has two sections: files and reports. It runs on IBM Personal Computers and compatibles with 348K bytes of memory, a single diskette drive and a hard disk drive, according to the vendor.

The program costs \$495.

Rainbow Software Systems, 23832 Bluehill Bay, Laguna Niguel, Calif. 92677.

Oakland Group, Inc. has announced **C-scape**, a screen generator for C developers designed for use on the IBM Personal Computer.

C-scape reportedly allows users to create input editing screens and menus in the C language.

It has syntax that extends C's Print-F function to include a menu definition language that allows screen addressing, field definition and data action and validation.

C-scape can be used directly with Bricklin's Demo Program, allowing users to create source code without having to re-enter such codes as screen contents and window coordinates, the vendor said.

C-scape costs \$149. With the Demo Program, it costs \$219.

Oakland Group, 675 Massachusetts Ave., Cambridge, Mass. 02139.

Software utilities

General Micro Systems has added PC220 to its line of terminal emulation packages.

PC220 provides full keyboard and screen emulation of Digital Equipment Corp. VT220, 200, 102, 101, 100 and 52 terminals. It runs on the IBM Personal Computer, Personal Computer XT, AT and compatibles.

Up to 30 soft keys can be defined. Scripts can be attached to keys or can be executed automatically when PC220 loads, according to the vendor.

An autodial directory is included as well as a shell key.

PC220 costs \$169.

General Micro Systems, P.O. Box 5330, 991 Valley View Road, Eden Prairie, Minn. 55343.

Colin James III has announced the **Algorithm of Syntactical Mnemonics (ASM)**, software intended to reduce the space and time needed for data transmission and storage.

ASM is said to be a one-pass data contraction software product. According to the vendor, it does not use compression, global search, packing, shifting or suppression. It reportedly offers direct throughput without buffering or I/O. It contracts alphanumeric data and processes data at a rate of 106K to 285K bit/sec. on an Intel Corp. 80286 at 8 MHz.

A corporate license costs \$1,000; per division site, the cost is \$100 a month. There is a \$1 royalty per personal computer disk sold.

Colin James III, Box 4, 480 S. Vine St., Denver, Colo. 80209.

Panasonic Industrial Co. has announced a **software tool** for its 32-ounce Personal Partner hand-held computer.

The software development tool is said to allow developers to create and test custom applications programs on any Microsoft Corp. MS-DOS computer then download the programs to the Personal Partner.

According to the vendor, programs can be developed in the Forth programming language or in Intel Corp. 8088 assembly language.

Applications can be run and debugged on the MS-DOS computer or directly in the Personal Partner via a random-access memory/read-only memory hardware device.

The software costs \$1,995.

Panasonic, One Panasonic Way, Secaucus, N.J. 07094.

General Optimization, Inc. has announced the **What's Best Personal Version** for personal computers.

What's Best is a spreadsheet optimization program. The personal version is not copy protected, and it runs on 256K bytes of random-access memory. According to the vendor, it can optimize spreadsheets with up to 800 numeric cells. Up to 250 of these cells can be variable.

What's Best Personal Version is priced at \$149. Other versions available include the Commercial Version for \$695 and the Professional Version for \$995.

General Optimization, 2251 N. Geneva Terr., Chicago, Ill. 60614.

Software data base management systems

Tominy, Inc. has released a version of its **Databasicplus** Basic data base manager, said to interface with the IBM Basic language version 3.2.

Databasicplus reportedly gives a programmer the ability to access a full logical data base system from the Basic programming language. According to a company spokesman, record holding logic, data independence, dynamic space allocation and data access by indexed and sequential keys are standard.

Databasicplus also supplies utilities to create and maintain the data base.

Databasicplus runs on IBM PC-DOS-compatible systems. It costs \$99.95.

Tominy, 4221 Malsbary Road, Cincinnati, Ohio 45242.

Software enhancements

Metasoft Corp. has released **The Benchmark Word Processor Version 4.5** for the IBM family of Personal Computers, the NEC Corp.

Continued on page 100

Orlando Senior High-Tech Specialists

Look for us in the classified section.



***the computer marketplace**

SYSTEMS / 34 • 36 • 38

**BUY, SELL & LEASE
COMPLETE IBM SYSTEMS**

**CPU'S • CRT'S • PRINTERS • UPGRADES
FEATURES & PARTS, ALL MODELS, NEW & USED**

**Discount Prices • Express Service
IBM Maintenance Guaranteed**

**A TRULY NATIONAL MARKET PLACE...
WHERE ONE TOLL FREE CALL DOES IT ALL!**

800-858-1144

***Division of QUALITY ASSOCIATES, INC. • IN CA (714) 630-2965
1140 N. Kraemer Blvd. • Suite B • Anaheim, CA 92806**

MARKET YOUR SOFTWARE

We are a successful programmer productivity tools firm looking for additional software to add to our product line. We have an established, national sales and support organization which has successfully sold and supported our present products, DATA-XPRT and IMS-XPRT. If you have an IBM mainframe product for application developers running under MVS, TSO/ISPF or IMS, we would like to hear from you. Please call or write

**Ms. Robertson
XA Systems Corporation
987 University Avenue
Los Gatos, CA 95030
(408) 395-1800**

XA SYSTEMS
THE DEVELOPMENT CENTER EXPERTS

Syllogists, Inc.

**presents
FREE-USAGE
SOFTWARE FOR DOS/VSE:**

- VSAM Programmer Productivity and Performance Tool, also eases transition to MVS (MVS version available)
- Disk Space Reporting Utility for VSAM and Non-VSAM spaces combined
- VTOC Maintenance Utility (Delete, Rename, Chg Expir Date)
- Disk Space Allocation Program for Non-VSAM Extents, invoked explicitly via EXEC-Statement or implicitly at OPEN
- Tape-VSAM Device Independence, controlled by execution time JCL (replace TLBL with VSAM-OLBL)
- Tape Management and Security System, requires NO JCL or program changes (completely transparent to application). Online Inquiry/Update to tape catalog

**SOFTWARE USAGE CHARGE: \$0
SUPPORT, MAINTENANCE,
ENHANCEMENTS: \$120/mo. or \$1200/yr.
SOURCE CODE LICENSES AVAILABLE**

More info. avail. upon written request. To order complete object code and/or doc. of all above software, send check (covers postage, materials, handling)
\$17 for doc. (hardcopy) + 6250 bpi tape (1600 bpi optional)
\$10 for documentation only (hardcopy)

**P.O. Box 34851, L. A., CA 90034
(818) 913-2170**

NEW PRODUCTS/MICROCOMPUTERS

Continued from page 99

APC and APC III, the Victor Technologies, Inc. 9000 and the Digital Equipment Corp. Rainbow.

Added features include the ability to include full-featured graphics in documentation or window-marked text in the Benchmark Graphics and enhanced cursor movement control; printer HEX codes can be imbedded within text. ASCII files from data base management systems can be inserted into a form document, and spreadsheet data can be imported into text.

Prices range from \$149 to \$695.

Metasoft, Suite 12, 6509 W. Frye Road, Chandler, Ariz. 85226.

package for users of streaming tape systems utilizing the Everex controller.

Version 4.0 performance improvements include the ability to conduct file-by-file operations at close to streaming speed.

Additional performance improvements are such features as performing backup on multiple backup sessions on the same tape and reduced storage requirements, according to the vendor.

Other features include movable nesting windows, on-line Help and a general-purpose notebook program.

Version 4.0 is priced at \$150.

Everex Systems, 48431 Milmont Drive, Fremont, Calif. 94539.

released Version 2.2 of its Timeslips memory-resident time and billing system for the IBM Personal Computer and compatibles.

Timeslips 2.2 includes added flat-fee billing options and the ability to adjust a bill up or down by a flat dollar or percent amount and reports on account billing history by month and year to date.

The system also includes added description of the work performed on the automated time record and a function key that reportedly allows users to duplicate any field on a time slip.

Timeslips 2.2 is priced at \$99.95.

North Edge Software, P.O. Box 286, Hamilton, Mass. 01936.

Tapestry Starter Packs consisting of a Tapestry Network Manager Pack and a Workstation Pack.

According to the vendor, Starter Packs provide enough software for a full-functioning two-station network.

Tapestry is network operating software. It features an icon-based user interface that integrates electronic mail, file and printer sharing and communications gateways, the vendor said.

Tapestry Starter Packs are priced at \$295 each.

Torus Systems, Suite 105, 495 Seaport Court, Redwood City, Calif. 94063.

Communications

Torus Systems has announced

Intelligent Technologies International Corp. has released **Modem Exchange**, a micro-to-mainframe communications product.

The Modem Exchange board features a 4.8K bit/sec. AT&T 208 A/B compatible modem. It plugs into any IBM Personal Computer or compatible expansion slot.

Using a standard phone line and the Modem Exchange software, the user can access any software application running in the Systems Network Architecture environment, including IMS, CICS and TSO/IPF, according to the vendor.

Modem Exchange features auto-dial for pulse or tone dialing of up to 36 digits in attended or unattended modes.

Modem Exchange is priced at \$1,995.

Intelligent Technologies International, 737 Lincoln Centre Drive, Foster City, Calif. 94404.

Galacticomm, Inc. has announced the **Galacticomm Breakthrough**, a 16-channel modem card for the IBM Personal Computer XT, AT and compatibles.

Together with the Software Breakthrough object library, Galacticomm Breakthrough can support up to 64 simultaneous users at a rate of 300 or 1,200 bit/sec., according to the vendor.

The software is IBM PC-DOS compatible, the vendor said.

Galacticomm Breakthrough costs \$7,450, including card, adapter, cable and software.

Galacticomm, 11360 Tara Drive, Plantation, Fla. 33325.

Data storage

Priam Corp. has introduced the **External Disk (ED)** and the **External Tape (ET)** series of desktop storage systems for the IBM Personal Computer family of microcomputers and compatibles.

The ED series consists of a 5¼-in. Winchester disk drive available in 43M, 60M or 103M bytes, interface card, installation and utility software and cables, according to the vendor.

The ET series consists of a 60M-byte, ¼-in. streaming tape drive, a removable tape cartridge, controller card, installation software and cables.

The ED series is priced from \$1,695 to \$2,995.

The ET series can be purchased for a price of \$1,895.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.

How to stay on top of the world of computers — and get a free gift in the process.



Get your very own copy of **Computerworld**, the newsweekly for the computer community, delivered directly to your desk, and get a free desktop solar calculator as a token of our thanks.

For over 19 years, *Computerworld* has covered the ever-changing world of computers and computer technology like nobody else... with full-time bureaus in 4 key regions of the U.S., in Paris and in Tokyo, as well as a worldwide network of 400 editors and reporters in over 25 countries. No one else has the fact-gathering, on-the-spot capability to give you the MIS/DP news you need like we do.

It's news that's timely. News that's important. News you can use. No matter where you are. No matter what your function in the computer community. No matter what your level of experience. Or responsibility.

What's in it for you?

Every week, *Computerworld* gives you the information you need in an easy-to-use, easy-to-digest format. You get:

News — page upon page reporting on the latest developments among users, and in the industry. With a Top of the News listing on Page One, and a more complete News Summary on Page Two. Plus news from around the world in World Digest. And a weekly Calendar of Events.

Editorial/Viewpoint — a look at the issues from our own experienced staff, as well as from guest contributors (including some of the top MIS/DP professionals in the business).

Executive Report. Comprehensive reports/investigations of issues, products, applications and technologies of pressing interest to computer managers.

Product Spotlight. A detailed view of key product categories — through introductory texts and comprehensive charts.

In-Depth. Essay reports on key trends and issues of the day, by leading experts and computer journalists.

Plus, Software & Services, Microcomputers, Communications, Systems & Peripherals, and Computer Industry — vendors, ventures, and visions of things to come. Plus Supreme Court rulings and new legislation affecting you and your company.

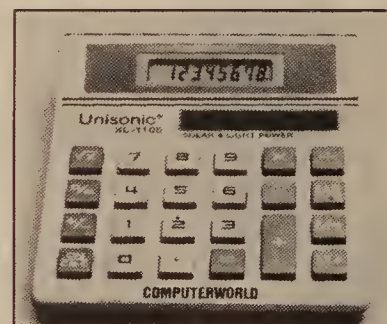
As well as a classified ad section — new job openings and new opportunities of possible interest to you. Plus hardware, software, and peripherals for sale or trade.

10 Bonus Issues

When you order your own subscription to *Computerworld*, you'll receive 10 issues of **COMPUTERWORLD FOCUS** at no extra charge. Comprehensive and timely, **COMPUTERWORLD FOCUS** gives you the most up-to-date information on the hottest topics in the field. Issues to come will feature Software, Office Automation, Communications, and more. You'll find selection criteria. Implementation strategies. Case histories. And more.

To help you plan, purchase, and save money. To help you make intelligent decisions — and keep current. All in **COMPUTERWORLD FOCUS**. All as part of your *Computerworld* subscription.

FREE Solar Calculator



Your 51-issue subscription costs just \$44 — only 86¢ an issue. And you get a handsome desktop solar calculator FREE when you send payment for your subscription. It's a big 4-1/4" x 4-3/4" calculator that features large, easy-to-press keys. And it never needs batteries because it's powered by light! Order yours today. It's yours free with your paid subscription to *Computerworld*!

Just as important as every other business tool you have — a desk, chair, telephone, and notepads — *Computerworld* is a "tool of the trade" you just shouldn't be without. And now with this special introductory/free gift offer, you should subscribe today! Return the postage-paid order card you'll find in this issue. Or call 1-800-544-3712 (In Pennsylvania, call collect 215-768-0388.)

Money-Back Guarantee

With *Computerworld*, you always have this guarantee: should you ever decide the publication is not for you, simply notify us, and we'll refund your money on all unmailed issues. No questions asked. No strings attached.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Subscribe today! Call TOLL-FREE 1-800-544-3712



When You First Bought
Hard Disk, You Thought
You'd Never Outgrow Its
Capacity.

You're About To Be Right.

NEW PRODUCTS/MICROCOMPUTERS

Printers/Plotters/
Peripherals

Output Technology Corp. has announced the **OT-700N** near-letter-quality printer.

The OT-700N has a draft speed of 200 line/min. and offers near-letter-quality Helvetica font styling with 10-pitch printing at 25 to 51 char./sec.

Other features are said to include dual-mode dot-addressable graphics, front-panel menu programming,

8K-byte buffer and front and bottom paper feed.

According to the vendor, multipitch printing up to 16.6 char./in., Epson America, Inc. FX and Digital Equipment Corp. LA-120 emulation as well as both serial and parallel interfaces are also featured.

The OT-700N near-letter-quality printer is priced at \$2,095.

Output Technology, Bay #33, E. 9922 Montgomery, Spokane, Wash. 99206.

ITT Qume has announced the **Profeeder 2EM** sheet-feeder.

The sheetfeeder was designed for users with large multipage and envelope addressing projects. It automatically snaps into the ITT Qume Sprint 11 Plus series daisywheel printers.

It is a demand-feed system with dual input bins and integral envelope feeder, which allows simultaneous printing of multipage documents and their envelopes.

The Profeeder 2EM is priced at \$1,195.

ITT Qume, 2350 Qume Drive, San Jose, Calif. 95131.

Applied Data Communications has introduced the **RDH 3.5 L/L Robotic Disk Handler**, said to load automatically, copy and apply wraparound labels to 3½-in. diskettes.

The disk handler can apply labels to as many as 100

diskettes per batch. It features both serial and parallel interfaces, enabling it to copy data from a host computer or from any of the vendor's duplication systems. It accepts a roll of up to 1,000 preprinted labels.

According to the vendor, the device also accommodates the requirements of Apple Computer, Inc.'s Macintosh and other 3½-in.-based systems.

The disk handler costs \$12,995.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680.

COMMUNICATIONS

Controllers

Black Box Corp. has introduced the **Black Box MNP Error Controller**.

The device is a networking protocol said to allow data communication between personal computers, networks or mainframes. When it detects a transmission error, it automatically returns that data block.

The device operates in three switch-selectable modes. It can communicate only with systems that use the Microcom Networking Protocol (MNP) error-checking protocol and automatically determine if the error-checking standard is active at the receiving end. The system can also operate as though the device were not present.

Priced at \$295, it can transmit data rates of 300, 1,200 or 2,400 bit/sec.

Black Box, P.O. Box 12800, Pittsburgh, Pa. 15241.

Standard Microsystems Corp. has introduced the **Arcnet-PC300** fiber-optic local-area network controller board.

The board incorporates the Raycom Systems, Inc. Raycom 3101 fiber-optic transceiver driver, the Standard Microsystems' COM9026 local-area network controller and the COM9032 Arcnet local-area network transceiver large-scale integration chip. It features a 2K-byte on-board data packet buffer and an on-board 8K-byte programmable read-only memory socket.

The Arcnet-PC300 is priced at \$995.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788.

Voice/data
communications

Infotron Systems Corp. has introduced its **Integrated Data Voice Multiplexer (IDVM)**, a data-over-voice system said to take advantage of

Continued on page 104



Oh, the joys of being a DP professional.

Every job has its share of problems. But DP professionals seem to be blessed with more than their fair share.

We can help you do away with some of the grief and hassle. Things such as JCL errors, production foul-ups, and maintenance problems.

Our JCLCHECK™ program spells "relief" from JCL problems. It catches all JCL errors, gives you complete, on-line error validation and concise diagnostics. Plus full documentation on a job stream, or entire production system, suitable for insertion in the run book.

Our ProDict™ program is the instant remedy for production headaches. It's an automatic, on-line dictionary of all your production jobs, data sets and programs, that can save

you the hours, days, even weeks now spent manually searching listings. It makes possible better scheduling, reliable contingency planning, and faster disaster recovery.

Our PerFix™ family makes current programming less of a pain to maintain. PerFix is our ever-growing, professional's package of maintenance tools to quickly, easily make every "fix" a perfect one. Programs to readily identify execution flow, make complete file comparisons, eliminate the guesswork in program testing. And more.

For all the details on JCLCHECK, ProDict, and the PerFix family, send the coupon, or call us at (408) 554-8121.

We'll deliver fast, long-lasting satisfaction.

Send me more about:

- ☐ the JCLCHECK program
- ☐ the ProDict program
- ☐ the PerFix family
- ☐ Have your representative call me.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

OPERATING SYSTEM _____



Triangle Software Company

4340 Stevens Creek Blvd., Suite 275
San Jose, CA 95129

Announcing the Bernoulli Box Plus.TM



It took Bernoulli
Technology to take the
limits off hard disk.

Introducing the Bernoulli Box Plus: a mass storage subsystem that gives users increased data availability on-line; infinite data expandability; and the versatility to manage everything from sophisticated networks (LAN) to power-user applications.

The Bernoulli Box Plus combines an 80-MB hard disk drive with two 20-MB drives that utilize high performance, removable Bernoulli disk cartridges. The two technologies are housed in a single external subsystem, providing a singular set of performance features and user benefits.

First, is the fact that the Bernoulli Box Plus is not simply an all-disk equivalent to hard disk with tape back-up. Bernoulli drives are high performance devices that run data as fast as your PC will allow. Speeds are identical whether you're using data housed on the hard disk drive or the Bernoulli drives. *More important—the Bernoulli drives represent removable, on-line, random-access storage.* So critical files can be *created* on cartridge; *saved* on cartridge (down to the most recent model or key stroke); *transported* on cartridge; *backed up* on cartridge (from another cartridge or from the hard disk); and *secured* on cartridge (in a desk drawer).

In data-intensive applications—such as computer-aided design and computer-aided engineering—the Bernoulli drives' on-line capabilities mean that operating systems and applications software can reside on the hard disk while other functions are brought on-and off-line via cartridges as needed.

The cartridges—infinitely expandable and strategically manageable by project or department—reduce capacity demands on the hard drive, boosting hard drive

throughput and long-term utility.

In addition, the cartridges provide the transportability and security that have helped make Bernoulli technology the new standard in mass storage solutions.

For the network user—the Bernoulli Box Plus represents the most sophisticated storage concept ever introduced. It can be used by many workstations—as a file server—or by any individual workstation. Again, the on-line capability of the Bernoulli drives permits efficient management of the hard disk's limited storage capacity. The Bernoulli Box Plus supports both PC NET and NOVELL networking environments and is compatible with any PC running under the IBM PC Network program.

Mainframe data management in the micro environment. Continuous availability of primary storage; immediate access to secondary files. This strategic structure—perfected in mainframe and mini environments—extends the capacity of hard disk and increases overall subsystem speed, reliability, transportability and versatility.

Hard disk capacity has finally come to a better end—with the beginning of the Bernoulli Box Plus.

For additional information, please call 1-800-255-5550, Extension 458.



IOMEGA
BERNOULLI TECHNOLOGY

NEW PRODUCTS/COMMUNICATIONS

Continued from page 102

tage of unused bandwidth on existing telephone lines to transmit both voice and data simultaneously.

The IDVM consists of a station unit and filters. It works with analog or digital private branch exchanges or Centrex-type telephone switching systems. It features an RS-232 interface.

The IDVM costs \$450 per connection.

Infotron, Cherry Hill Industrial Center-9, Cherry Hill, N.J. 08003.

Honeywell, Inc. has introduced the **Delta-Plex Series 100** electronic six-wire, key-telephone system.

Based on two processing units, the Delta-Plex 100 family offers three models. The Delta-Plex 101 serves users with up to 16 stations; the Delta-Plex 102 services up to 32 stations; and the Delta-Plex 103 serves up to 64 stations.

Any station or group of stations may be programmed to appear on one instrument or group of instruments.

The series costs \$450 to \$700 per station line.

Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

Protocol converters

Perle Systems, Ltd. and **GSD Systems, Inc.** have announced an **RS-422 capability** for Perle's 350 family of protocol converters.

The family includes the 350/294 unit for the IBM System/34, 36 and 38 and the 350/327 unit in two models that provide IBM 3270 systems network architecture/binary synchronous control and 3770 protocol conversion for mainframe systems.

It allows from four to 40 asynchronous terminals, printers and personal computers to be interfaced to IBM System/34, 36 and 38 or mainframes.

The RS-422 option costs \$200 per four ports.

GSD Systems, Suite 507, 600 S. Dearborn St., Chicago, Ill. 60605.

Software

EKD Computer Sales & Supplies Corp. has announced **PCanywhere**, said to allow any terminal or personal computer with a modem to access an IBM Personal Computer, Personal Computer XT, AT or compatible remotely.

The remote user is said to have full keyboard control over all PC functions including access to printers, other peripherals and data on floppy or hard disks. Up to 16 passwords can be specified, and an initial command line can automatically run a program at logon.

PCanywhere is said to

support up to 32 different terminal makes. Features include bidirectional file transfer, electronic mail message and access to network functions of Novell, Inc.'s Advanced Netware.

PCanywhere costs \$95.

EKD, 764 Middle Country Road, Selden, N.Y. 11784.

Codex Corp. has announced the **Codex Communications Test Equipment**

(CTE) software for its 2600 series of high-speed modems.

The software is said to allow users to run the circuit quality tests used by Bell technicians on leased lines.

According to the vendor, it integrates the features of a transmission impairment measurement set and remote data scope to analyze line impairments and monitor, collect and analyze data traffic on a circuit.

The user can also evaluate protocols to determine poten-

tial errors and mismatches.

The CTE software is priced at \$1,500.

Codex, 20 Cabot Blvd., Mansfield, Mass. 02048.

Multiplexers/Modems

Able Computer has introduced the **QHV** and the **QHV Plus** multiplexers for Digital Equipment Corp. Microvax II and other Q-bus-based systems.

The QHV is an eight-line asynchronous multiplexer,

said to be fully compatible with DEC's DHV/11. It allows direct memory access or single programmed transfers.

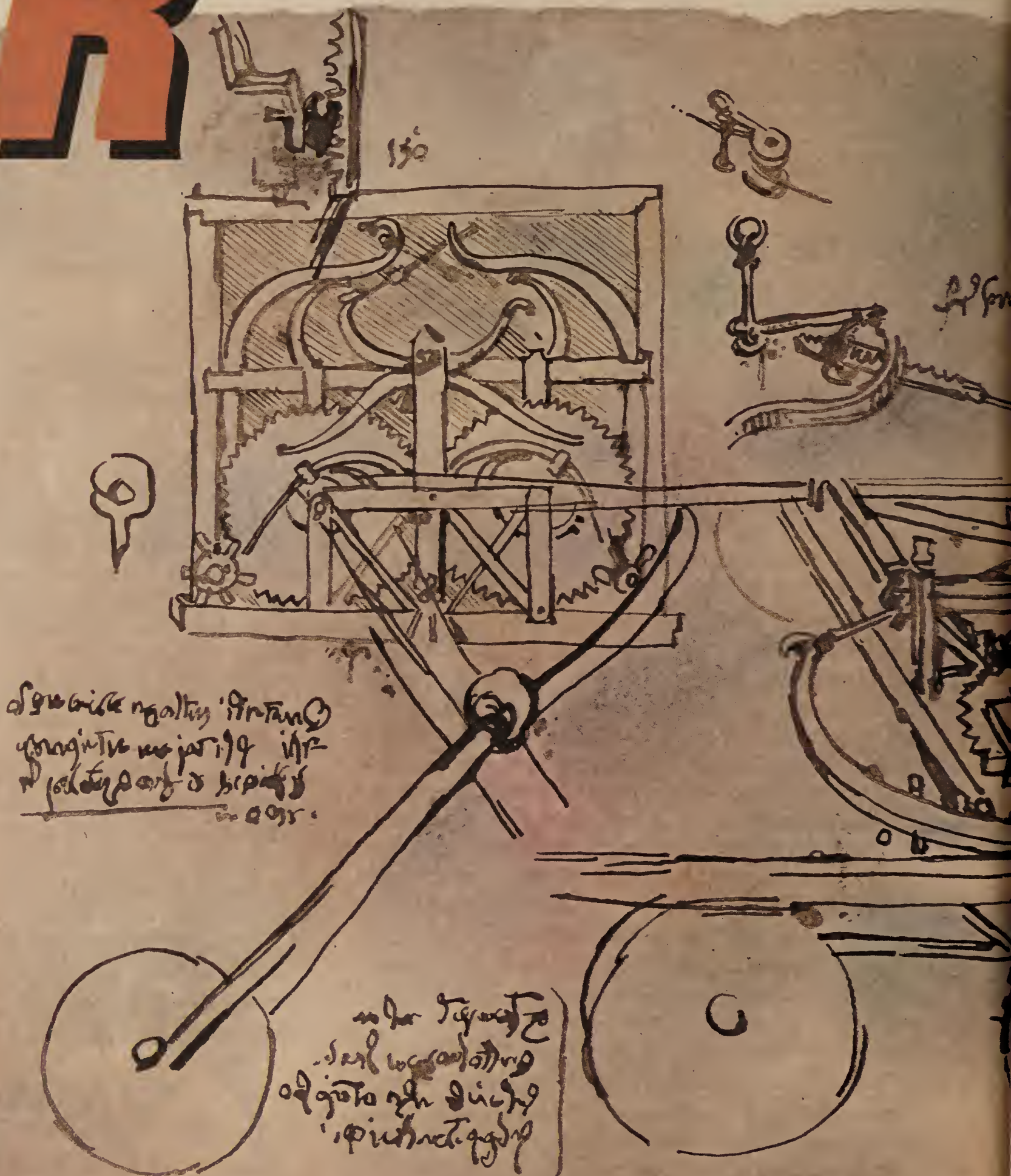
The QHV Plus is a 16-channel multiplexer. It is compatible with the DHV/11 and includes all standard DEC emulation features.

The QHV costs from \$1,195 to \$1,395. The QHV Plus costs \$1,495 or \$1,695 with panels.

Able Computer, 3080 Airway Ave., Costa Mesa, Calif. 92626.



Remember When the Idea of Automotive



NEW PRODUCTS/SYSTEMS & PERIPHERALS

SYSTEMS
& PERIPHERALS

Terminals

Seiko Instruments USA, Inc. has introduced the **GR-1105** color graphics display terminal.

The display terminal is said to execute 4,500 short vectors per second from display-list memory. It also features a 14-in. 1,024- by 780-pixel resolution screen and a

32,768- by 32,76-point coordinate space.

The GR-1105 terminal is priced starting at \$4,995.

Seiko Instruments USA, 1623 Buckeye Drive, Milpitas, Calif. 95035.

Intecolor Corp. has announced the **Colortrend 4100 Model 100**, a terminal for data representation and analytical applications.

The terminal provides 249

different fill patterns, a tube dot pitch of 0.31mm, 16 colors and throughput up to 38.4K bit/sec.

The Colortrend 4100 comes with a mouse, detachable keyboard and programmable function keys.

The terminal costs \$2,695. Intecolor, 225 Technology Park, Norcross, Ga. 30092.

Monitronix Corp. has announced the **MX-4190** ultra-

high-resolution color monitor.

The 19-in. analog red-green-blue monitor features 60Hz noninterlaced refresh rates. It offers 1,600- by 1,280- pixel displayable resolution at 0.25mm pitch. Horizontal scan rates are user-specifiable from 40 kHz to 80 kHz.

The MX-4190 monitor is priced from \$5,995.

Monitronix, 2971 Silver Drive, Columbus, Ohio 43224.

Printers/Plotters

Olympia USA, Inc. has introduced its **Olympia XL 120** and its **XL 121 with Spell Check**, two portable electronic typewriters.

The XL 121 with Spell Check features an on-board 80,000-word dictionary. A personal dictionary of 300 words can also be created.

Both models feature 40-char. correction memory for automatic lift-off of errors from the page, automatic return for uninterrupted typing, automatic centering, automatic decimal tabulation, special horizontal and vertical spacing capabilities and print enhancements, including bold print and underlining.

The XL120 costs \$319, and the XL 121 with Spell Check costs \$399.

Olympia U.S.A., Box 22, Somerville, N.J. 08876.

Xpoint Corp. has announced the **6224** rugged dot matrix printer for use with IBM's System/34, 36 and 38 computers.

According to the vendor, the 6224 can emulate IBM's 5225 and 5256 printers in local or remote settings, connecting through standard twin-axial cables.

The dot matrix printer is said to support all IBM software except APL. In place of APL, Xpoint features a firmware package called Feature Control.

According to the vendor, Feature Control provides proportional printing and letter-quality modes, 16 foreign character sets, 10 character sizes and a range of bar code options.

Xpoint 6224 is priced at \$4,850.

Xpoint, Suite 130, 5600 Oakbrook Pkwy., Norcross, Ga. 30093.

Dyna Five Corp. has announced the Digital Equipment Corp. Q-bus-compatible **D5-LP100** line printer controller.

The controller is said to offer a 300,000-char./sec. data transfer rate. Other features are said to include switch-selectable device addresses, switch-selectable interrupt address vectors, parallel interfaces and adjustable data strobe timing.

According to the vendor, the D5-LP100 line printer controller operates in Q16, Q18 and Q22 bit-address backplane and is transparent to DEC software.

It is a dual-height board said to be Centronics Data Computer Corp. and Data-products Corp. compatible.

The D5-LP100 is priced at \$140.

Dyna Five, 12040 Western Ave., Garden Grove, Calif. 92641.

Transportation Couldn't Get Out of First Gear.

As you can see from the accompanying illustration, the differential transmission wasn't the brainchild of Detroit.

No, it was more like Italy. And the engineer was none other than Leonardo Da Vinci.

Needless to say, talking differential transmissions over a plate of pasta in the 15th century was not altogether fashionable and, naturally enough, was met with some skepticism.

Today, of course, the American love affair with the car is rather evident. We couldn't live without it.

Keeping in mind the automobile as an accepted fact of life, we'd like to introduce you to a service that will become a standard in maintaining complex voice and data communications systems.

Introducing Communications Service Assurance from PacTel Spectrum Services.

A service every MIS director and telecommunications manager wanted but refused to believe in.

"Wish list thinking," they said.

And wish list thinking is what we're offering.

Communications Service Assurance is a new concept, to be certain, and, just like Leonardo's differential transmission, will be met with its share of skepticism.

That's OK. We're asking that you keep an open mind.

Communications Service Assurance represents a single source for problem detection, diagnosis and preventive monitoring, as well as expediting restoral of your corporate communications. It helps with expansion and alteration and gives you customized services.

Communications Service Assurance packages the comprehensive solution for improving your system performance. You're able to concentrate on strategic MIS responsibilities instead of playing catch-up and reacting to the hassle, headaches and hang-ups of day-to-day problems plaguing your system.

Communications Service Assurance can be applied to any equipment, any protocols, at any site.

It incorporates diagnostic hardware and software.

It delivers teams of experienced test engineers from diversified backgrounds.

It accesses a unique system inventory data base.

It involves an ongoing industry relations program.

Remember, this is a service.

We sell no hardware, lease no lines and repair no equipment.

What we do sell is increased reliability, productivity, bottom line cost-effectiveness and any level of expertise available 24 hours a day (we never close).

We're a wish that's a reality.

We're a service that will become as accepted and important as the automobile.

And, yes, we'll keep you rolling in the right direction.

For further information, please call 800-446-4321. Or you can write directly, PacTel Spectrum Services, 100 Pringle Avenue, Suite 750, Walnut Creek, CA 94596, attention N. Floyd, Marketing Director.

PAC * TEL
Spectrum Services

A Pacific Telesis Company

See us at ICA Booth #1944

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Houston Instrument has introduced the **DMP-29**, an intelligent 11-in. by 17-in., eight-pen plotter featuring a maximum pen speed of up to 22 in./sec.

The DMP-29 features Houston Instrument's DM/PL resident plotter language. It will define window limits, scale plots, vary line intensity, produce European character sets and automatically describe circles, ellipses and general curves.

The DMP-29 costs \$2,295.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

Printek, Inc. has introduced the **Formspro 2000** printer for multipart forms printing.

The printer offers 200 char./sec. print speed and incorporates an 18-pin print head. It accommodates forms up to 13.6-in. wide and from 1-in. to 24-in. long. According to the vendor, print quality from the first through the ninth part is clear and legible.

The Formspro 2000 costs \$2,195.

Printek, 1517 Townline Road, Benton Harbor, Mich. 49022.

Houston Instrument has introduced the **True Grid** line of seven digitizers featuring standard RS-232C-compatible interfaces.

The 1000 series was designed for cursor control and menu-picking applications. Features include resolution of 0.005 in.; choice of transducers and active areas of 5-in. by 5-in., 11-in. by 11-in. and 11-in. by 17-in.

The 8000 series targets mechanical, electrical, surveying, mapping and architectural applications. Features include resolution of 0.001 in.; choice of transducers; and active areas of 11-in. by 11-in., 11-in. by 17-in., 18-in. by 24-in. and 24-in. by 36-in.

Prices for the 1000 series range from \$495 to \$975. For the 8000 series, prices range from \$1,150 to \$4,340.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

Facit, Inc. has announced a **bar code option** for its Opus 1 laser printer.

The bar code version was designed to extend the word processing and correspondence printing of the standard Opus 1 in multiuser business environments. It can print on pressure-sensitive, temperature-resistant labels and on letter-size paper.

The printer can print at 12 page/min. and offers a print resolution of 300 by 300 dot/in.

The bar code version of the Facit Opus 1 costs \$9,500.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

The 14-pen **DMP-51/52 MP** series plotters from **Houston Instrument** are said to feature a resolution of 0.001 in., a maximum plotting speed of 22 in./sec. and user-selectable acceleration.

The series was developed for architectural, engineering, scientific and other drafting-intensive applications. The plotters are C- and D-size and contain Houston Instrument's

built-in DM/PL plotting language.

The DMP-51/52 MP series costs \$6,495.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

Houston Instrument has added the E-size **DMP-56** to its family of professional drafting plotters.

The DMP-56 plotter is said to accommodate 18 different media sizes, ranging from 8½-in. by 11-in. to 36-in. by 48-in. It is said to produce architectural designs, engineering schematics, mechanical drawings and overhead transparencies.

The DMP-56 features a resolution of 0.001 in. and a maximum plotting speed of 17 in./sec. It can be interfaced with any computer featuring a standard RS-232C-compatible port.

The DMP-56 costs \$5,995.

Houston Instrument, 8500 Cameron Road, Austin, Texas 78753.

Versatec, Inc. has announced the **Model 810** raster processing machine, a single microprocessor-based rasterizer.

The Model 810 is said to drive Versatec electrostatic color and monochrome plotters.

It is a 32-bit microprocessor with 2M bytes of on-board memory.

According to the vendor, the Model 810 was designed to off-load data ordering and rasterization from the host computer.

The Model 810 raster processing machine is priced at \$7,950.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

Power Supplies

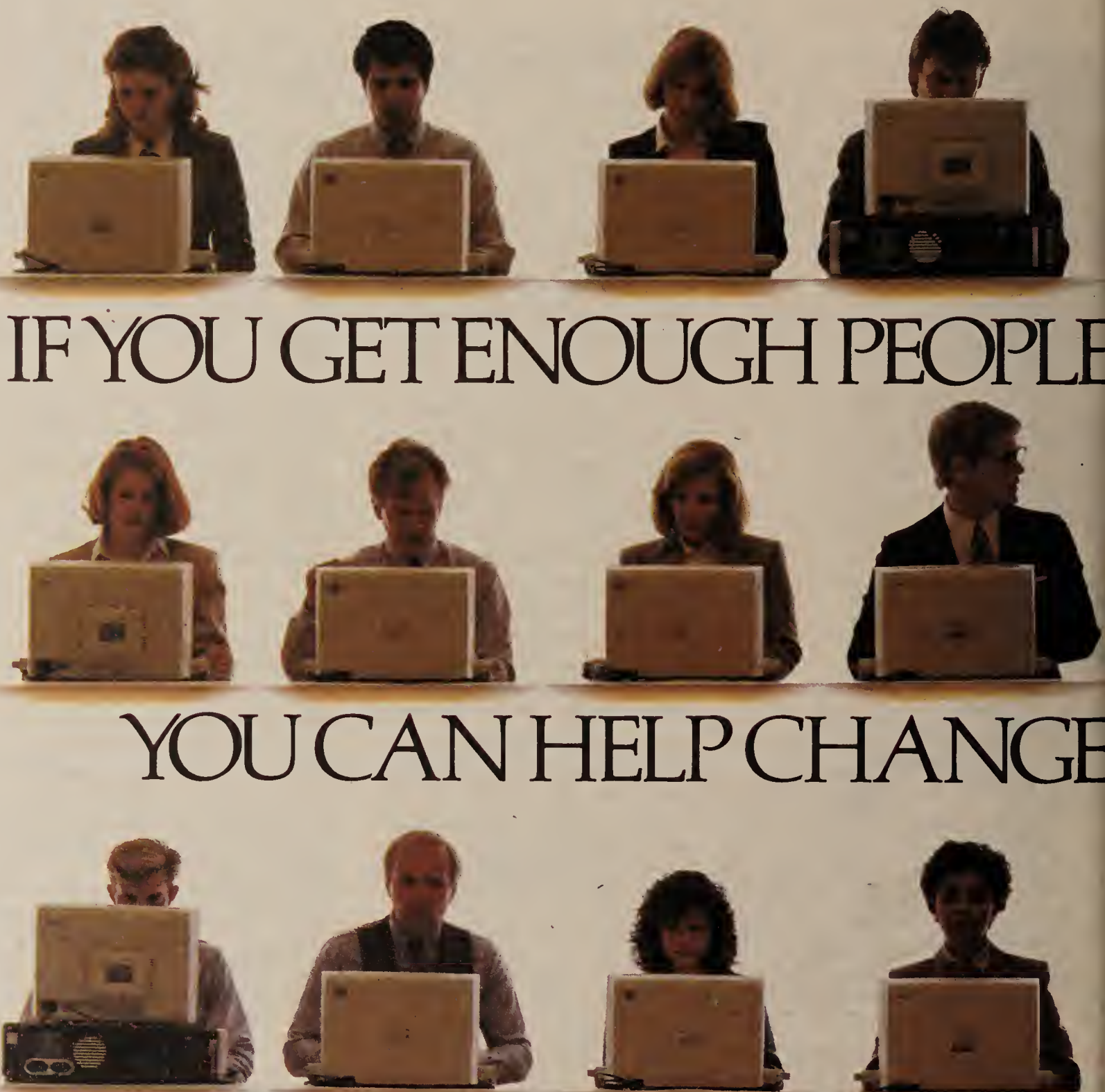
Sola, a unit of **General Signal**, has announced a series of 5, 7.5, 10 and 15 kVA **uninterruptible power systems**.

The systems are said to feature fourth-generation electronic pulse-width modulation inverters.

The models operate continuously from the inverter, with on-line battery reserve. Each system can handle a 125% overload for 60 min without drawing current from the battery. Battery reserve times at full load are 12 min for the 5 kVA model, 6 min for the 7.5 kVA model and 3 min for the 10 kVA model. The 15 kVA model is dependent on the battery.

Prices range from \$12,200 to \$24,800.

Sola, 1717 Busse Road, Elk Grove Village, Ill. 60007.



IF YOU GET ENOUGH PEOPLE

YOU CAN HELP CHANGE

The Travelers employs nearly 3,000 dedicated people in data processing

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Computer Power Systems Corp. has announced the **Series 2000** power distribution and regulation system for mini and supermini systems.

The Series 2000 is semiconductor based and is said to cope with power irregularities such as surges, sags, transients and brownouts.

A single-phase model and a three-phase model are available. According to the vendor, both offer monitoring of the user's computer-room temperature and humidity and tap switching.

In addition, all I/O cables can be connected to either the back or front of the unit.

Prices for the Series 2000 power distribution and regulation system range from \$5,000 to \$10,000.

Computer Power Systems, P.O. Box 6240, 18150 S. Figueroa St., Carson, Calif. 90749.

L/F Technologies has introduced the **L/F-Power II** integrated uninterruptible power supply for the vendor's Ultima terminals.

The L/F Power II resides within the terminal case. It is reportedly preconfigured to provide the exact level of DC power required by the Ultima terminal in the event of a power disturbance. It provides up to one hour of battery backup power.

The L/F Power II is priced at \$150. L/F Technologies, 2800 Lockheed Way, Carson City, Nev. 89701.

Sorenson Co. has introduced the **DCR-T** series of three-phase, 10-kW, DC-regulated power supplies for controlled test and burn-in applications.

The DCR-T is said to protect loads from current and voltage caused by

open programming lines. It separates remote programming from remote sensing, eliminating the possibility of voltage breakdown across output components.

Standard input is 480V AC at 60Hz. The DCR-T is remote controllable. The units fit into standard 19-in. racks.

The DCR-T units are priced at \$3,900.

Sorenson, 676 Island Pond Road, Manchester, N.H. 03103.

Auxiliary equipment

Rediform has introduced **thermal transfer computer paper** for use with thermal transfer printers.

According to the vendor, the paper offers extra-smooth quality that enables wax-based inks to transfer onto the sheet without cracking, flaking

or rubbing off.

Rediform's computer paper costs \$8.99 for a 250-count pack.

Rediform, W-53 Century Road, Paramus, N.J. 07652.

PRICE REDUCTIONS

Priam Corp. has cut the prices for its 43M- and 60M-byte **Innerspace** internal disk add-in kits for the IBM Personal Computer family.

The kits consist of a 5¼-in. Winchester disk, an optional controller, Priam software and utilities and cables.

The reduced prices are as follows: ID40-AT/XT costs \$1,398; ID40-PC costs \$1,698; ID60-AT/XT costs \$1,798; and ID60-PC costs \$1,098.

Priam, 20 W. Montague Expwy., San Jose, Calif. 95134.

Interleaf, Inc. has announced a price reduction for its **electronic publishing system** running on Digital Equipment Corp.'s Vaxstation II.

Including laser printer, the system is available now for \$29,900. Also included is Interleaf's electronic publishing software, TPS; DEC's Vaxstation II system configuration with 3M bytes of memory, 71M-byte Winchester disk and 95M-byte streaming tape cartridge; and all fonts.

Interleaf, Ten Canal Park, Cambridge, Mass. 02141.

General Business Technology, Inc. has announced a price reduction on both the **5220DP** and the **5222DP** dual-purpose matrix printers.

Both printers are said to feature adjustable tractor feed with tear bars as well as a variety of user-programmable or host-selectable character fonts and styles.

The 200 char./sec. 5222DP is now priced at \$2,495, and the 400 char./sec. 5220DP is now priced at \$4,450.

General Business Technology, 1891 McGaw Ave., Irvine, Calif. 92714.

TOGETHER WHO CARE

THE WORLD.

If you're interested in joining us, send your resume in confidence.

Data Processing for Dedicated People.

The **Travelers** 

An Equal Opportunity Employer.

RPG V S/38 Fifth Generation Code Generator

New from Help/38, the RPG V System will cut your coding by 80%. It lets you enter RPG V code in SEU, and then it generates RPG III instantly. It also checks for syntax errors on the spot. Plus more:

- Decrease coding time dramatically with 15 minutes of practice
- Enter 100 lines of code in SEU without hitting "enter" once
- Also includes 10 powerful SEU enhancements
- Just \$995/CPU

FREE USER GUIDE

For complete RPG V facts, call toll free: 1-800-328-1000, ext. 125

HELP/38
SYSTEMS

210 Baker Technology Plaza
6101 Baker Road, Minnetonka, MN 55345
612/933-0609 Telex: 290184



DATA GENERAL ASKS: WHAT WILL YOUR OFFICE SYSTEMS COST YOU DOWN THE ROAD?

OUR CEO® BUSINESS AUTOMATION SOLUTIONS GIVE YOU THE LOWEST COST OF OWNERSHIP.

Bypass the high cost of other companies' office automation systems. With Data General's line of fully compatible computers. The industry leaders in productivity.

Our new MV/20000™ provides superior price/performance. Better than DEC's VAX™ or IBM's 4300 series. While our MV/2000DC™ sets the standards for departmental computing systems.

We take you beyond office automation. By integrating

mainframes, PC's and applications into our industry-leading CEO Business Automation. And by cost effectively distributing your information resources.

We also protect your investment with our commitment to industry standards in communications and data management.

It all adds up to advanced Business Automation solutions. To give you the lowest cost of ownership.

All of which makes Data General the best route to take. For more information, call 1-800-DATAGEN (in Canada call 1-800-268-5454). Or write: Data General, 4400 Computer Drive, MS C-228, Westboro, MA 01580.

Data General
a Generation ahead.



NEWS



CALENDAR

WEEK OF JUNE 1

JUNE 2-5, DETROIT — **Vision '86 — Applied Machine Vision Conference and Exposition.** Contact: Vision '86 Public Relations, Machine Vision Association of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 2-5, NASSAU BAY, TEXAS — **International Symposium on Ada Programming Language Applications for Space Station Development.** Contact: University of Houston — Clear Lake, 2700 Bay Area Blvd., Houston, Texas 77058.

JUNE 2-6, NEW YORK — **Communications Week '86.** Contact: Merle Pilkins, Conference Manager, Datapro Research Corp., McGraw-Hill Information Systems Co., 1221 Avenue of the Americas, New York, N.Y. 10020.

JUNE 4, SAN FRANCISCO — **How to Build Your High Tech Career Network.** Contact: Association for Women in Computing, Bay Area Chapter, Suite 44, 55 Sutter St., San Francisco, Calif. 94104.

JUNE 4-6, BOSTON — **Engineering Expert Systems.** Contact: Harmon Associates, 151 Collingwood, San Francisco, Calif. 94114.

JUNE 4-6, SAN DIEGO — **1986 National Educational Computing Conference.** Contact: Susan M. Zgliczynski, National Educational Computing Conference 1986, School of Education, University of San Diego, Alcala Park, San Diego, Calif. 92110.

JUNE 5-6, CLEVELAND — **North Central Region Data Processing Trainer's Conference.** Contact: Gary Livingston, Livingston & Associates, P.O. Box 30619, Cleveland, Ohio 44130.

JUNE 7, BEIJING — **China-Didacta '86: The International Trade Fair for Educational Equipment.** Contact: Swiss Industries Fair, Secretariat China Didacta '86, P.O. Box CH-4021, Basel, Switzerland.

JUNE 7-8, BOSTON — **Massachusetts Health Data Consortium 3rd Annual Computer Expo and Conference.** Contact: Massachusetts Health Data Consortium, Inc. 400-1 Totten Pond Road, Waltham, Mass. 02154.

WEEK OF JUNE 8

JUNE 8-11, NEW ORLEANS — **Ethernet Decision-Makers Group Exchange Conference.** Contact: EDGE International, Inc., Suite 260, 1539 N. China

Lake Blvd., Ridgecrest, Calif. 93555.

JUNE 8-11, TORONTO — **World Computing Services Industry Congress V.** Contact: Co-Ordination Plus, Inc., Suite 2102, 65 Queen Street W., Toronto, Ont., Canada M5H 2M8.

JUNE 9-10, TEANECK, N.J. — **Machover on Business Graphics.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

JUNE 9-11, MYRTLE BEACH, S.C. — **The Association of Small Computer Users in Education 19th Annual Summer Conference.** Contact: Jack Cundiff, Horry-Georgetown Technical College, Conway, S.C. 29526.

JUNE 9-11, NORCROSS, GA. — **Time and Motion Study Fundamentals.** Contact: Institute of Industrial Engineers Registrar, 25 Technology Park/Atlanta, Norcross, Ga. 30092.

JUNE 9-12, BOSTON —

Network Management/Technical Control Conference and Exposition. Contact: CW/Conference Management Group, 375 Cochituate Road, Framingham, Mass. 01701.

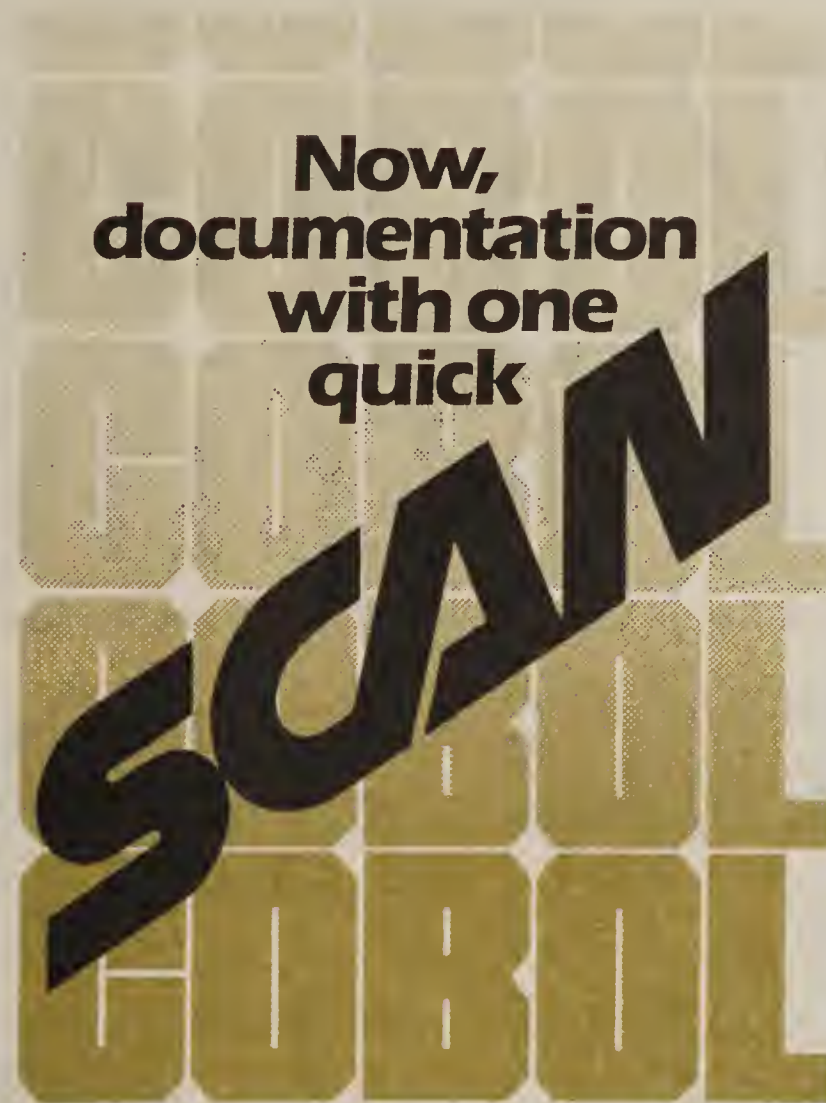
JUNE 9-12, CHICAGO — **Com Lease Spring, The Computer Leasing Conference and Expo.** Contact: Show Management Offices, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

JUNE 9-13, SAN DIEGO — **MUMPS Users' Group**

15th Annual Meeting. Contact: MUMPS Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

JUNE 10-13, ATLANTA — **Summer 1986 Unix Conference and Exhibition.** Contact: The Usenix Association Conference Office, P.O. Box 385, Sunset Beach, Calif. 90742.

JUNE 11, NEW YORK — **The Semiconductor Industry — Its Changing Structure** — See CALENDAR page 110



SCAN/COBOL takes the effort out of program documentation. Nothing's more important to document than source code, but nothing gets done less.

Now SCAN/COBOL will automatically document any COBOL program—no matter how long or complex—in the source code, where it's most effective.

No matter how many changes you make, SCAN/COBOL keeps all your source level documentation up-to-the-minute. Whether it's your own COBOL program or a vendor's, SCAN/COBOL gives you the critical information you need—whenever you need it—in clear, easy-to-follow form.

And SCAN/COBOL guarantees that all your source code gets documented in exactly the same way. Programmers will become productive sooner, develop reliable programs faster, and maintain them easier.

SCAN/COBOL does what no other analysis tool can. It simulates the execution of every cleanly compiled program. SCAN/COBOL saves hours and hours of testing and computer time by giving you critical information that shows how your program will run. It highlights poorly structured code in simple, concise graphs; pinpoints the illegal use of keywords; and reveals hidden bugs and maintenance booby-traps— all before the program runs.

Group Operations, Inc.
1110 Vermont Avenue NW
Washington, DC 20005
Offices in Atlanta, Boston, Chicago, Dallas,
Los Angeles and New York. Find out how
SCAN/COBOL improves programmer productivity,
EDP auditing and program documentation.
Call Cheryl Maloney today at (202) 887-5420



NEWS

CALENDAR from page 109

ture 1986. Contact: Robert Burton, L. F. Rothschild, Unterberg Towbin, 55 Water St., New York, N.Y. 10041.

JUNE 11-13, MAINZ, WEST GERMANY — **International Tandem Users' Group 1986 Spring Conference.** Contact: ITUG Headquarters, Suite 600, 111 E. Wacker Drive, Chicago, Ill. 60601.

JUNE 11-13, TEANECK, N.J. — **Machover on CAD/CAM.** Contact: Carol Every, Industry Representative, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

WEEK OF JUNE 15

JUNE 15-20, LONG BEACH, CALIF. — **1986 Government Management Information Sciences Conference.** Contact: Tom Lang, Assis-

tant Chairman, Data Processing Department, 9150 E. Imperial Highway, Downey, Calif. 90242.

JUNE 16-18, UNIVERSAL CITY, CALIF. — **Synergy '86, Conference on Functional Interfacing for Computer-Integrated Manufacturing.** Contact: Cheri Willetts, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 16-19, LAS VEGAS — **The 1986 National Computer Conference.** Contact: National Computer Conference, 1899 Preston White Drive, Reston, Va. 22091.

JUNE 16-20, CAMBRIDGE, MASS. — **Managing Information Technology: New Responsibilities in a Changing Environment.** Contact: Center for Information Systems Research, Sloan School of Management, MIT, E40-193, 77 Massachu-

setts Ave., Cambridge, Mass. 02139.

JUNE 17-18, PLYMOUTH, MICH. — **Robotic End Effectors: Design and Applications Seminar.** Contact: Mary Dombrowski, Special Programs Division, Robotics International of the Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

JUNE 18-20, TOKYO — **Marketing Opportunities Seminar.** Contact: Agnes M. Pavel, Program Director, U.S. Telecommunications Suppliers Association, Suite 1618, 333 N. Michigan Ave., Chicago, Ill. 60601.

WEEK OF JUNE 22

JUNE 22-27, PHILADELPHIA — **Management Information Systems for Strategic Advantage.** Contact: The Registrar, Office of Executive

Education, 200 Vance Hall, The Wharton School of the University of Pennsylvania, Philadelphia, Pa. 19104.

JUNE 23-25, ALBUQUERQUE, N.M. — **Integrated Fiber-Optic Technology Training.** Contact: Linda Castle, Optoelectronic System Consultants, P.O. Box 35525, Albuquerque, N.M. 87176.

JUNE 23-25, MIAMI — **Electronic Data Processing Auditors Association 14th Annual International Conference.** Contact: EDPA, P.O. Box 88180, Carol Stream, Ill. 60188.

JUNE 23-26, BOSTON — **ATE East '86.** Contact: Morgan-Grampian Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

JUNE 23-27, AMSTERDAM — **Fourth Annual European Fiber-Optic Communications and Local-Area Networks Exposition.** Contact: Information Gatekeepers, 214 Harvard Ave., Boston, Mass. 02134.

JUNE 23-27, CHICAGO — **A/E/C Systems '86: The Computer and Management Show for the Design and Construction Industry.** Contact: Conference Director, A/E/C Systems '86, P.O. Box 11318, Newington, Conn. 06111.

JUNE 24-26, CHICAGO — **Structured Techniques Association III/Structured Techniques in the Eighties: Practice and Prospects.** Contact: Heller Financial Corp., 105 W. Adams St., Chicago, Ill. 60603.

JUNE 24-27, CHICAGO — **Autocad Expo '86.** Contact: William Ryan, Autocad Expo '86, Autodesk, Inc., 2320 Marinship Way, Sausalito, Calif. 94965.

JUNE 25, CHICAGO — **International Facility Management Association's Computer Applications for Facility Management.** Contact: IFMA, Suite 1410, 11 Greenway Plaza, Houston, Texas 77046.

JUNE 25-26, COATESVILLE, PA. — **Chester County Expo '86: CAD/CAM Conference from Micro to Mini.** Contact: Lee Smith, Central Chester County Vocational Technical School, 1635 E. Lincoln Highway, Coatesville, Pa. 19320.

WEEK OF JUNE 29

JULY 2-3, LAS VEGAS — **Full Meeting of the Design Automation Standards Subcommittee.** Contact: Ron Waxman, Design Automation Standards Subcommittee Co-Chairman, IBM FSD, 9500 Godwin Drive, Manassas, Va. 22110.

WEEK OF JULY 6

JULY 9-11, NEW YORK — **The Fourth Annual PC Expo.** Contact: PC Expo, P.O. Box 1026, Englewood Cliffs, N.J. 07632.

WEEK OF JULY 13

JULY 13-18, CHICAGO — **Guide 65.** Contact: Guide International Corp., 111 E. Wacker Drive, Chicago, Ill. 60601.

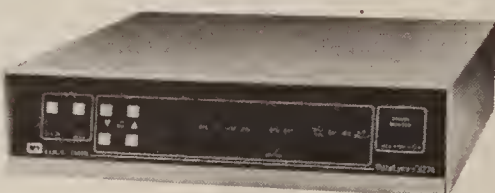
WEEK OF JULY 20

JULY 23-25, BOSTON — **Micro-trends '86, Education: Redirecting the Revolution.** Contact: Bobbi Hunt, International Communications Industries Association, 3150 Spring St., Fairfax, Va. 22031.

LOCAL DATA — MAP TO — IBM CONNECTIVITY

It's Easy to Solve IBM Connectivity Problems With Local Data Protocol Converters

EASY IBM HOST ACCESS



Get immediate host access from an async PC, CRT or printer with DataLynx/3274 or 5251. Use it instead of a cluster controller for economical, secure local and remote connectivity.

A Fresno (CA) hospital uses DataLynx to bring nine DEC VT-100 terminals on line with a BSC host 200 miles away at Blue Cross offices in Los Angeles.

The hospital transfers confidential patient and medicare data to Blue Cross using inexpensive async modems. Administrative productivity is increased through better patient account control and cash flow problems are solved with faster insurance compensation payments.

InterLynx/3287 attaches virtually any low cost ASCII printer anywhere you can plug in a 3287, allowing a major department store to access their IBM 4381 with a Texas Instruments 850. This provides an efficient and inexpensive method of printing bridal registry service announcements. The credit department also uses the TI850 for efficient printing of records and reports.

3287 SPOKEN HERE



Convert your 3270 coax devices to RS-232 today. Then place your coax terminals anywhere your PABX, data switch or LAN wiring goes. Mix or match Async and Coax terminals in the network. Sound great? It is.

3270 COAX RECYCLING CENTER



TruLynx PC software provides fast easy file transfer to IBM host programs through DataLynx Protocol Converters. In one major application company executives update financial planning databases from PC's at home and in the office. In another application source code for large mainframe application programs is transferred to and from PC's for demonstration, test and editing.

SPEEDY PC FILE TRANSFER

ROUTE 3X

Local Data offers two excellent System 34, 36, 38 connectivity products. DataLynx/5251 provides exceptional dialup async access with X.25 and ETU file transfer support.

InterLynx/5251 connects to the host at the twinax port, eliminating the costly communications adapter. Users access the host by way of asynchronous modems or local RS-232C connections.

InterLynx/5251 moves data at 38.4Kb and supports print rates to 5200 cps. DataLynx/5251 recognizes up to 32 LUs, dual sync hosts and supports data at 19.2Kb and 9600 baud.

Customers of a restaurant supply house in Denver dial an IBM/36 host through a DataLynx/5251, check inventory levels, current pricing and perform their own order entry.

This is especially helpful to ski area concession operators who prepare large quantity orders during off hours, cutting delivery time to their mountain locations.

The supplier gives better service, maintains improved inventory and passes savings on to his customers. The customer has better inventory control, schedules deliveries to suit his needs, and maintains easy communications with his supplier.

Do business with a company that gives you outstanding service and support, a company with an installed base of more than 17,500 units worldwide.

Since 1977, Local Data has been a profitable manufacturer of quality products backed by a twelve month guarantee and an experienced technical support team.



2771 TOLEDO STREET, TORRANCE, CA 90503 TLX 182518

TRAVELER'S AID

Now! Convert any Async minicomputer or PC into a dependable remote job entry station with DataLynx/3780.

One customer in Hawaii using Prime and Microdata computers for account receivable and payroll data entry, accesses a payroll/service bureau IBM 4300 host with DataLynx/3780.

LOW COST RJE



Get the full connectivity story. Call 213/320-7126. Canada 613/748-9751. UK (0753) 76537.

IBM is a trademark of International Business Machines DEC is a trademark of Digital Equipment Corp. Prime is a trademark of Prime Computer, Inc. Microdata is a trademark of McDonnell Douglas Corp. TI850 is a trademark of Texas Instruments

AT performance at an XT price. Introducing the TeleCAT-286. \$2995. Complete.



With TeleVideo, you always settle for more.

For some time, you've known exactly what kind of PC you could get with a mid-range budget.

But now, you can settle for a whole lot more. With the new TeleCAT-286™ from TeleVideo.

It starts you off with everything you need. Including IBM AT compatibility. A 20MB hard disk. A 1.2MB floppy. An Intel 80286 CPU that runs at either 6 or 8 MHz. Even a high-resolution 640x400 pixel monitor for text and graphics. Standard.

To make even better use of internal space, we socketed the TeleCAT-286 for one MB of RAM, and also included serial and parallel ports on the motherboard. As a result, we can still give you three extra expansion slots.

And we didn't stop there. We've also designed more ergonomic features into the TeleCAT-286. Including sculptured keycaps on a high-quality keyboard. LEDs right on top of the three critical locking keys, so they won't get covered up by overlays. And a footprint that's 28% smaller

than the IBM AT's. So you get more of your desk back, too.

There's a lot more we could say about the TeleCAT-286. But it's an even better idea to get your hands on it. So call 1 (800) TELECAT, Dept. 132, and we'll tell you where you can try one.

The TeleCAT-286. Our 20MB version is \$2995; 30MB, \$3495. For high performance at a low price, don't settle for less.

 **TeleVideo®**
Settle for more.

TeleVideo Systems, Inc., 1170 Morse Avenue, Sunnyvale, CA 94088-3568 • (408) 745-7760

©1986 TeleVideo Systems, Inc. IBM is a registered trademark of International Business Machines, Inc. Screen graphics by Chartmaster ©Decision Resources, Inc.

Multiple Host Sessions—Up To 7 Combinations of Displays and Printers—Simultaneously (Available Only On AST-5251/11 Plus)



Multiple Printer Sessions, Including 5256, 5224 and 5225 Emulation On PC-attached Printer

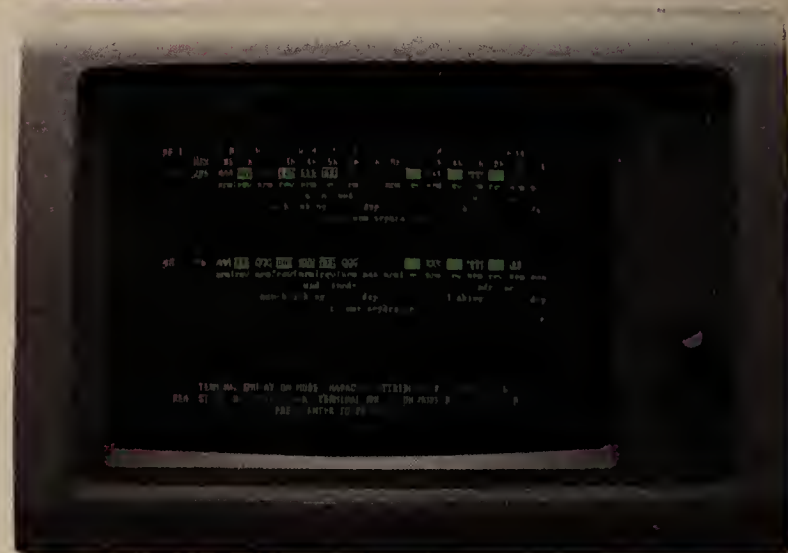
Programmable Printer Format Configuration



Bidirectional File Transfer



Automatic Sign-On With Password Security



Display Attribute Configuration

Now! Compatible With IBM® PC Support/36 And PC Support/38

Build Your Smart Office The Smart Connection™ For

Loaded with the sophisticated features you need, we've just made our original AST-5251/11 even easier to use and more efficient for increased user productivity, and introduced an enhanced version too—AST-5251/11 Plus™. Now you have lots of new reasons to make AST "The Smart Connection" for your evolving smart office.

Office Smarts—We've Got Them. At AST we've been building solutions for IBM® PC connectivity—the foundations of smart offices everywhere—long before it was a popular concept. You might say, with the over one million AST PC enhancements installed, over 20,000 PC to System 34/36/38 connections and the thousands and thousands of PC to IBM mainframe and local area

network gateway connections we've established worldwide, that we've already made a substantial commitment to helping people realize their fundamental visions of the "smart office."

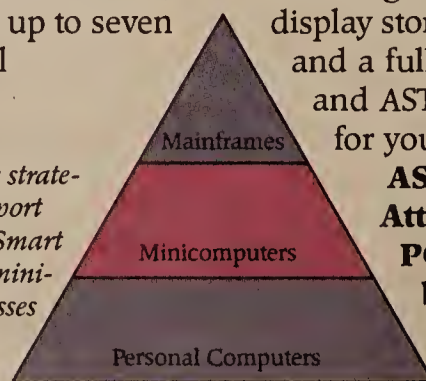
AST-5251/11—The Direct PC To 34/36/38 Connection. Standard twinax cable, just like IBM's, makes this connection the most convenient for you. Our Hot-Key support provides a toggle between PC DOS and two host sessions. And our new enhanced version, AST-5251/11 Plus, even allows up to seven System 34/36/38 sessions—all concurrently.

AST's family of smart connections are strategically focused and developed to support and evolve in concert with the IBM Smart Office architecture. Highlighting the mini-computer group here, AST also addresses connectivity in mainframe and personal workstation environments.

Our file transfer system means you can move host data to and from your favorite PC application software files, like Lotus 1-2-3®, WordStar® and dBASE™. For easy integration of PC and host applications, we've included our Applications Program Interface (API).

Add all our features illustrated above—everything from bidirectional file transfer to automatic 34/36/38 sign-on with password security, multiple printer support including 5256, 5224 and 5225, snapshot display storage, keyboard mapping help, and a full line of companion products—and AST-5251/11 really spells smart for you.

AST-5250/Display™—Model 11 Attributes and Standard IBM PC Monochrome Display Capabilities. Used with your AST-5251/11 card, the AST-5250/Display makes your PC's



AST-5250/Display
Products For Full Model 11
Display Attributes And PC
Compatible Graphics



User Definable
Keyboard Mapping



Displayable Keyboard Map
of Program Control Keys



Display Snapshot
Storage Buffer



Proven In More Than 20,000 Direct And Remote
PC to System 34/36/38 Connections Worldwide

20,000

Even More Features

AST-5251/11 Plus or AST-5251/11

- Plugs into PC/XT/AT and compatibles; connects to System 34/36/38 via twinax cable and supports cable thru
- Emulates 5251-11, 5291 or 5292-1 display terminal
- Upgrade Kit for AST-5251/11 to AST-5251/11 Plus
- Selectable DMA and I/O interrupt channels
- Applications Program Interface (API) included
- Supports fixed or hard disk
- Hot-Key assist for concurrent PC and multiple host sessions
- IBM FSU compatibility (for virtual disk support on the System 34/36/38)
- Third Party Software support, including ASTLink by Fusion,[®] Laguna Laboratories' DecisionLink[™] and The BOSS[®] by TenMan Systems
- Complete package includes hardware, software, twinax cable assembly & user manuals

AST-5250/Display

- Used with AST-5251/11 brings full IBM 5251 Model 11 character and text display attributes to your IBM monochrome display
- Provides standard IBM PC &

- IBM 5251/11 monochrome display capabilities & a parallel printer port
- Hercules compatible high-res bit-mapped graphics interface
- Automatically switches from 5251/11 display to PC display mode without operator interaction

AST-5250/Display-C

- Used with AST-5251/11 brings IBM 5292 Model 1 display attributes to your PC's color display
- Provides compatibility with IBM PC Color Graphics Adaptor with full-spectrum color capabilities
- Includes parallel port
- Automatically switches from 5292 Model 1 display to PC display mode without operator interaction

AST-5251/12

- A total solution for remote PC/XT/AT/Portable or compatible to System 34/36/38 communications in SNA environments
- PC emulation for IBM 5251 Model 12 terminal
- Host-addressable 5256 printer support on PC-attached printer
- Applications Program Interface (API) allows integration between host and PC applications
- Includes hardware, software and comprehensive user documentation

On AST-5251/11: Your PC to System 34/36/38

monochrome display look just like an IBM Model 11 display.

And it gives you high-resolution Hercules[™] compatible bit-mapped graphics, high quality text and a parallel port.

Now PC 5251/11 emulation is even easier for you because you're working with a screen identical to IBM's. And you can take advantage of the graphics capabilities offered by today's software.

AST-5250/Display-C[™]—IBM 5292 Color Attributes and Standard IBM PC Color Graphics Too. Use this card with your AST-5251/11 and your IBM color monitor for all of IBM's 5292 screen text attributes. And

some really colorful PC graphics.

Our color capabilities are completely compatible with your PC software favorites like Framework[™], Symphony[™], Lotus 1-2-3[®], Business Graphics Systems[™] and DESQview[™]. There's also a parallel port to make printer and plotter connection easy and convenient.

AST-5251/12[™]—Remote PC to 34/36/38 Connections. For remote communications in SNA/SDLC environments, this complete hardware/software package lets you use your PC as a remote 5251 Model 12 terminal, and your attached PC printer is host-addressable to emulate a 5256 printer. Our Applications Program Interface also makes integrating host and PC applications easy.

Representatives in Mexico:

Mexel
Calle Diagonal 27
Col. del Valle
Mexico D.F. 03100
Telephone 660-4323
Telex 1771823 MDEI ME

PC Center de Mexico S.A.
Insurgentes Sur No. 1677-301
Mexico D.F.
Telephone 524-0965
Telex 1771571 CULI ME

**AST
RESEARCH INC.**

AST Research, Inc.
2121 Alton Avenue
Irvine, CA 92714
(714) 863-1333
TWX: 753699 ASTR UR



AST-5251/11, AST-5251/11 Plus, The Smart Connection, AST-5250/Display, AST-5250/Display-C and AST-5251/12 trademarks of AST Research, Inc. IBM registered trademark of International Business Machines Corp. WordStar registered trademark of MicroPro International Corp. Lotus and 1-2-3 registered trademarks and Symphony trademark of Lotus Development Corp. dBASE and Framework trademarks of Ashton-Tate. Hercules trademark of Hercules Computer Technology. Fusion registered trademark of Fusion Products International. DecisionLink trademark of Laguna Laboratories, Inc. The BOSS registered trademark of TenMan Systems, Inc. Business Graphics System trademark of Peachtree Software, Inc. DESQview trademark of Quarterdeck Office Systems. AST-5251/12 is a product developed by AST Research, Inc. and Software Systems, Inc. of Jefferson City, MO, and is protected under U.S. Copyright Law.

COMPUTER INDUSTRY

Section begins on page 146

Two business styles grow out of Mohawk Data Sciences

MDS Qantel nemesis becomes firm's defender

By Clinton Wilder

HAYWARD, Calif. — When Asher B. Edelman wanted to shake the bad apples out of Mohawk Data Sciences Corp.'s MDS Qantel computer unit in early 1985, he turned to flamboyant "antivendor" attorney Thomas K. Christo to fill a seat on the MDS board. Two weeks ago, after MDS finally sold the bulk of its U.S. operations for much-needed cash, MDS Qantel raised quite a few eyebrows by naming Christo president and chief operating officer of the minicomputer firm.

Christo gained fame in the 1970s and 1980s representing users and distributors in multimillion-dollar lawsuits against several vendors, including IBM, Hewlett-Packard Co. — and Qantel. But after the Edelman takeover and the recent sale of five MDS divisions, the MDS Qantel that Christo now heads bears little resemblance to the one he faced in the courtroom.

"I always felt it would be a heck of a company if you changed the way it did business," Christo said. "In the past, I was always criticizing. Now I

have an opportunity to be constructive instead of destructive."

In the past year, MDS Qantel has completely eliminated direct sales to the end user, focusing entirely on the value-added distributor channel. Under Christo and Chairman and Chief Executive Officer Matthew E. Tutino, the firm also gutted several layers of top management.



Thomas Christo

"We had to tear down before we could build up," Christo said, "and we had to survive. Only one vice-president that was here a year ago is still here. It was a minor miracle that the company survived."

By selling all of its businesses except Qantel (see story at right) in trademark Edelman style, MDS reduced some \$140 million in debt to \$40 million and removed itself from default on its bank loans. Although it remains to be seen whether MDS Qantel can advance from financial viability to sustained profitability, Christo predicts that the firm will be in the black when its first fiscal quarter ends July 31.

Competing in the mid-range minicomputer area staked out by IBM's System/36 and 38, MDS Qantel will rely on a revamped product line and the sales skills of its value-added dis-

See MDS page 116

Venture capital firms pick up Momentum

By Alan Alper

NEW YORK — It was not long ago that computer industry pundits were taking wagers on the demise of Mohawk Data Sciences Corp. But after a stormy few years resulting in huge debts, Mohawk was recently reincarnated as Momentum Technologies, Inc. under the ownership of two New York venture capital firms.

In the last two years, Parsippany, N.J.-based Mohawk Data Sciences had lost its technological edge and was swaying under the heavy weight of \$234.2 million in combined 1984 and 1985 losses. Arbitrageur Asher Edelman, who took control of the company in 1984 vowing a piecemeal divestiture similar to what he had done at Management Assistance, Inc., was having trouble selling any part of the beleaguered firm. Unlike Management Assistance, the sum of Mohawk's parts did not appear to be greater than the whole.

On the sidelines, seeking a service-oriented computer company, were venture capitalists Donald Ackerman, a general partner at J. H. Whitney & Co., and Bruce Anderson of Welsh, Carson, Anderson & Stowe. Mohawk, despite its losses, seemed

ripe for a leveraged buy-out.

Negotiating first with Mohawk's lenders and then its board of directors, the two venture capital firms struck a deal that would enable them to purchase a majority of Mohawk's assets — excluding MDS Qantel, Inc. (see related story) — as well as buy time to breathe life into its moribund operations. Mohawk's banks gave the new owners a three-year respite on the principal payment of the \$81 million borrowed to acquire five Mohawk business units: MDS Service, MDS Systems, MDS Credit, MDS Storms and MDS Herkimer [CW, May 12].

"We are taking over a business that is immediately profitable and cash-flow positive," Ackerman said in a recent interview. "The service business was the most profitable part of the business; it was Qantel that experienced declining revenues and was not profitable."

The new owners have restructured the five MDS business units, which last year generated revenues of \$160 million, into four Momentum subsidiaries. The only remaining unit owned by Mohawk, MDS Qantel, retains a 10% interest and a seat on the new firm's board. Also, it will receive technical support fees for the maintenance of its installed base.

Momentum will focus mainly on See VENTURE page 116



THE CICS TOOLBOX

CALL
1-800-833-TONE
1-800-833-8663

from
TONE
Software Corp.
1735 S. Brookhurst
Anaheim, CA 92804

IN CALIFORNIA
AND CANADA
1-714-991-9460

"PAINT" Your CICS Screens
Instantly with

FAST FORMAT

- Generates BMS Macros Automatically!
- Saves Application Programmer Time!
- Online Test Display Facility
- Create and Maintain 3270 Screen Formats Online



Multiply Your CICS Power with

MULTI-TRAN

- Up to 4 Concurrent CICS Transactions!
- Windowing!
- Each Window PFKey Selectable!
- Split Screen Review and Scrolling!



Set Your Tech Support Staff Free with

CSMT LOCK

- Divides CEMT/CSMT Master Services
- Supports Cross Partition File Opens/Closes
- CEMT Commands From Offline Jobstreams
- Easy to Use Menus and Prompts



Add TSO to Your
CICS Network
with

TCC

"THE CICS CONNECTION"

- Simultaneous TSO-CICS Sessions!
- Includes MULTI-TRAN Features
- Eliminates Intersession Logon/Logoff
- Supports TSO-SPF Functions



SOLID Support for Online
Application Development with

TS- DEARS

- Data Entry
- Retrieval & Update
- Job Submittal
- Online Screen Definition
- Interactive Programming Language
- User Access/Security Controls

Get Cost Effective
CICS Security Now
with

TS-SAFE

- Eliminates Sign-on Table Maintenance
- Covers Users, Terminals, Transactions
- Selection Menus Keyed to Passwords and Security Profiles
- Security Logging/Statistical Data



Announcing

Computerworld's New MICRO DIRECT SHOPPER

An easy way for you to order micro products.

Now you can order microcomputer products directly from suppliers through Computerworld's new MICRO DIRECT SHOPPER.

Beginning with this issue, Computerworld's display classified section will include MICRO DIRECT SHOPPER, an all new section designed especially for companies that sell their micro products by mail or telephone orders.

This can mean a savings of money, time and energy in locating and acquiring the micro products that you need. MICRO DIRECT SHOPPER will appear preceeding the Buy-Sell-Swap section every week in Computerworld.

Starting this issue, see page 125.

COMPUTERWORLD

A PUBLICATION OF
CW COMMUNICATIONS

Now it costs even less to look good.

The Cordata Desktop Printshop™ has always been the best value in PC-compatible laser printers.

With speed and flexibility that the others can't match. Type fonts on diskette, not expensive cartridges. Data transfer up to 30 times faster than Hewlett-Packard's LaserJet+. Features implemented in software, for easy update. And Epson™ emulation, so it runs with most MS-DOS programs.

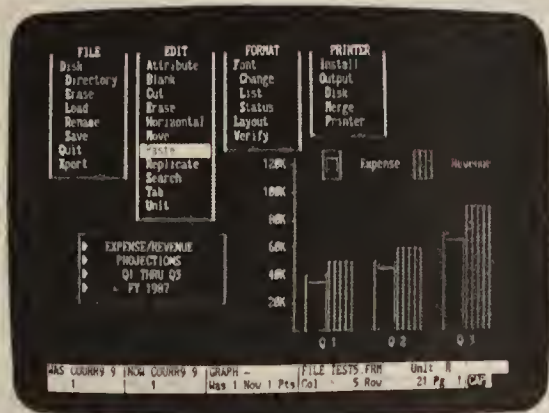
But now the Desktop Printshop is an even better value:

A menu-driven forms design software program for rapid document creation, the industry-acclaimed Wordstar 2000™ word processing program, and 38 fonts on diskette are included with the Desktop Printshop, for the amazingly low price of \$2995.

So don't settle for just any laser printer. Demand the Desktop Printshop.

All it takes is a call to Cordata at: (800) 621-6746 (in CA: (805) 495-5800; in Canada: (604) 984-0641) for the name of your nearest Desktop Printshop dealer.

After all, how can you afford *not* to look your best?



Not to mention
being easier.

The Desktop Printshop.™

CORDATA, 275 E. Hillcrest Drive, Thousand Oaks, CA 91360
TELEX 650-2696270; in Europe: Holland 032-18111

~~\$3395.00~~
\$2995.00



cordata

formerly **corona**
data systems, inc.

COMPUTER INDUSTRY

MDS Qantel nemesis

From page 114

tributor network. MDS Qantel has several vertical software packages, with more on the way, after employing what Christo called "SWAT teams to clean up the software" in the past year.

Although Christo downplayed the irony of serving the company that he once served only with lawsuits, some of MDS Qantel's recent changes strongly reflect his litigation legacy. He successfully represented several distributors against the company and made significant changes in the structure of Qantel's relationship with its resellers.

"We have no quotas anymore," he said. "We have milestones for the value-added distributors to earn a larger discount, but it's not Armageddon if they don't make it. And we have no exclusives, so the onus is on us to come up with the best solution for the value-added distributors to resell. The whole world is open to them."

Perhaps most significantly, Qantel has attempted to minimize the effect of its recent turmoil on its small business user base, particularly in maintenance. Under a 10-year royalty agreement, Qantel users will continue to be serviced by the former MDS Service division, now a unit of Momentum Technologies, Inc.

"Amazingly enough, the changes haven't affected us," said Jeff Croft, DP manager of Bauer Enterprises, Inc., a retail lumber and home hardware business in Stow, Ohio.

Christo admits that the small business minicomputer competition is "scary" but is ready to take on competitors the same way he tried to take on the whole industry. "There are a lot of choices out there for the customer, but you can look at it as exciting, too," said Christo, who still maintains his North Hampton, N.H., law office. "If we guess right, we'll be heroes."

HP announces flat earnings

From page 146

Shipments of the high-end products, code-named Spectrum, are not due until year's end and are not expected to contribute to 1986 revenue.

Earlier this month, however, HP announced it was returning most employees from an unpaid vacation program to full-time work but was implementing a hiring freeze at the company.

Announcing
Computerworld's
MICRO DIRECT
SHOPPER

SEE PAGE
125

Venture firms get Momentum

From page 114

systems maintenance, systems integration and reselling, contract manufacturing and lease financing. Hardware design and development, which Ackerman says caused Mohawk's downfall, will be limited to IBM 3270-compatible peripherals.

The key to the firm's success will be its ability to broaden its service business beyond Mohawk's installed base into the third-party arena.

Momentum inherits one of the industry's largest service organizations, with \$70 million in annual revenue, 135 locations nationwide and an 800-member work force.

Ackerman said Momentum will focus greater attention on servicing computer networks and mixed vendor environments.

Three of the four subsidiaries are

”

Momentum inherits one of the industry's largest service organizations, with \$70 million in annual revenue.

being run by managers who remained during the transition from Mohawk to Momentum, and approximately 40 employees currently have equity

holdings in Momentum.

"It's important that people behave and think like owners of the company and share in the success they create," Ackerman said.

In addition, most of Mohawk's 1,700 employees have stayed on with the new venture. "The people are the most important asset we acquired," Ackerman said. "They understand the operation and have knowledge about the accounts. They kept the company going under the most trying of times."

Business and economic conditions permitting, Ackerman said Momentum can grow at roughly 20% annually. Without offering a timetable for such growth, Ackerman said it "can be achieved through internal growth. It can be achieved more quickly, however, with some judicious acquisitions."

Learn to Build and Attend the Network Management/Technical

June 9-12, 1986

World Trade Center, Boston

NM/TC is a highly focused, technical conference.

It is designed to brief network managers and technical control personnel on the latest products, services, concepts and software available to solve the problems of complex networks in today's rapidly changing telecommunications environment.

NM/TC is a must for network managers.

The conference offers useful and to-the-point help in coping with a variety of management and technical issues from planning to SNA networks.

Conference Program — June 11th and 12th

The NM/TC conference offers a special opportunity for network managers, with hard-hitting and professional presentations. NM/TC is specifically designed for those managers who must operate at two levels - both managerial and technical. Forty sessions are offered.

Exposition — June 11th and 12th

The exhibits will display state-of-the-art equipment from the leading vendors in the industry where you can personally examine the next generation of network control centers, management systems, modems, multiplexers, diagnostic and test systems, and more.

NM/TC sponsoring exhibitors play a prominent role in the show — Avant-Garde Computing, Datacomm Management Sciences, and Racal-Milgo.



Exhibitors —

Atlantic Research, Connections Telecommunications, Digilog, Digital Communications, Digitech Industries, INFINET, Infotron Systems, NCR Comten, *Network World*, Northern Telecom/Spec-tron, TP+P, Telenex, Telephony, Venator Systems, Versa-Lite Systems, Wandel & Goltermann.



Keynote Speaker:
Richard J. Holleman
Director of Standards Practices, IBM Corp.

Featured Session:
Top Vendors of 1990
Will Zachmann
Chairman
VP/Research, IDC

In-Depth Tutorials — June 9th and 10th

Industry experts will instruct full-day courses on network control, IBM/SNA network management systems, strategic planning and network diagnostics.

Monday, June 9, 1986

9:00 am - 5:00 pm

Select One

T-1 Fundamentals of Network Control
Gabriel Kasperek, President, Kazcom, Inc.
The basics of network control, including problem diagnosis and repair, maintenance and operational issues.

T-2 Integrated Voice/Data Corporate Networks
Roshan Lal Sharma, Sr. Scientist/Consultant, Telecommunications Network Science.

Network topologies and their synthesis, cost-effective network planning, future trends in intelligent networks and their impact on network management and control.

T-3 Cost Efficient Methods for Implementing New Tariffs
Cheryl A. Cushing, Manager, Reference Services, Connections Telecommunications, Inc.

Post-divestiture tariff rules, including LATAs and POPs with a comparison of major common-carrier tariffs, and evaluation of intra-LATA access alternatives and a review of new regulatory alternatives to traditional network costs.

T-4 ISDN I
Samuel Lynch, Senior Consultant, Zatyko Associates.

Definition and concepts, application standards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 System Network Architecture I
Thomas Routt, Senior Consultant, Zatyko Associates.

Current status of IBM's communication architecture, new extensions such as LU 6.2/APP and NETBIOS and IBM LANs as "defacto" standards.

COMPUTER INDUSTRY



MERGERS AND ACQUISITIONS

Hammer Technologies, Inc. reported that its subsidiary, **Hammer Computer Systems, Inc.**, has acquired all of the issued and outstanding stock of **Certified Software Systems, Inc.**, a Portland, Ore.-based software company. Certified, a developer of single and multiuser horizontal and vertical software, will be operated as a wholly owned subsidiary of Hammer Computer Systems.

GSD Systems, Inc. has signed a letter of intent to sell 100% of its outstanding stock to **Perle Systems, Ltd.**, a Toronto-based manufacturer

of data communications equipment. **GSD Systems** is a distributor of protocol convertors, data communications equipment and other products for the IBM System/34, 36 and 38.

SHL Systemhouse, Inc. announced it has completed the purchase of all outstanding shares of **Capital Systems, Inc.** of Alexandria, Va., in exchange for 360,000 shares. Capital Systems becomes a unit of **Systemhouse, Inc.** of Arlington, Va., the U.S. subsidiary of SHL Systemhouse, Inc.

Micro-Integration, Inc. and **IE Systems, Inc.**, both privately held, have jointly formed **Micro-Integration Corp.** Micro-Integration is one of the industry's first microcomputer communications software companies.

Charlton Associates of Irvine, Calif., has announced a merger with **Xidex Corp.** of Santa Clara, Calif.

Charlton will become a wholly owned subsidiary of Xidex. Richard Charlton, chairman and chief executive officer of the current company, will head the newly created subsidiary.

It is planned that the subsidiary will incorporate Charlton Associates' current rigid media operations, Xidex's Dysan small disk division and Xidex's newly acquired trimedia sputtered thin-film operation.

Travelers/Diebold Technology Co. announced that it has completed the acquisition of **Execom Systems Corp.**, a decision support systems software company, from **Continental Telecom, Inc.** of Atlanta.

Amdahl, NAS at crossroads

From page 146

the battle, as Storage Technology Corp. found out after becoming the first PCM vendor to reach the billion-dollar level in 1982. The following year, Storage Technology's revenue was down to \$887 million, and in October 1984 the company filed for bankruptcy. After trimming itself down to a \$673 million level in 1985, the premier peripheral PCM vendor is now operating under the theme "(back) on the road again."

Becoming a \$1 billion company, therefore, requires a whole different mind-set, a new level of management skill and maturity. Unlike Storage Technology, a company that expanded too fast in too many directions, Amdahl has a realistic chance of achieving solid revenue growth in the next two years. By the end of 1988, the first PCM vendor may well be twice the size it was in 1985.

Amdahl enters 1986, the year in which it will start shipping the new 5890-300 dual processor, determined not to repeat the mistakes it made when the 580s were first introduced about four years ago. "We'll be a lot more cautious with the 5890 than with the 5860," says Dick Witcomb, Amdahl's director of financial and public relations. The company plans to ship a few machines in the second

Computer Industry section begins on page 146.

Control Your Network

Control Conference and Exposition



Kasperek



Lal Sharma



Cushing



Lynch



Roull



Zatyko



Rhue

T-6 Public/Private Data Network I
Daniel Zalyko, President,
Zatyko Associates.

Current status of IBM's communication architecture, including applications and standards, and development of X.25 up to 1988 CCITT adoption.

T-7 MAP/TOP Systems Interconnection I
Donald Harring, Vice President,
Zatyko Associates.

Status of seven layer OSI Reference Model as framework for future network compatibility, review of major vendor architecture - IBM, DEC, etc; migration to manufacturing automation and office communication protocols.

Tuesday, June 10, 1986

9:00 am - 5:00 pm
Select One

T-8 Planning the Network Control Center
Gabriel Kasperek, President, Kazcom, Inc.

User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor issues.

T-9 Problem Resolution and Network Management in SNA Networks
Fred Cook, Senior Consultant
Kaptronix.

Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences, VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in NCP System Generation.

T-10 Network Modeling/Design Workshop
Larry Rhue, Vice President,
Connections Telecommunications Inc.

Network design calculations using MNDS PC-based design software and the complementary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multiplexers and distributed concentrator networks.

T-11 ISDN II
Samuel Lynch, Senior Consultant,
Zatyko Associates.

Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

T-12 System Network Architecture II
Thomas Roull, Senior Consultant,
Zatyko Associates.

Technology and systems impact of SNA and relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA, PU 2.1, etc.

T-13 Public/Private Data Network II
Daniel Zalyko, President,
Zatyko Associates.

Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and office document interchange formats under different operating systems.

T-14 MAP/TOP Systems Interconnection II
Donald Harring, Vice President,
Zatyko Associates.

Session will cover MAP/TOP common protocol connectivity, GM and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor standards and products.

You can't afford to miss NM/TC, the most comprehensive technical show of its kind held at the World Trade Center, Boston's high tech showplace.

To register, please fill out the coupon below and send it to NM/TC, Box 9171, Framingham, MA 01701-9171 or call us at (800) 225-4698 or (617) 879-0700.

Network Management/Technical Control Conference & Exposition

Box 9171, Framingham, MA 01701-9171

☐ **YES**, please register me for NM/TC at the World Trade Center, Commonwealth Pier, Boston.

Conference Fees

- ☐ One-day Conference & Expo (includes lunch) \$100.00
Check one: ☐ Wednesday, June 11 ☐ Thursday, June 12
- ☐ Two-day Conference & Expo (includes lunch) \$195.00
June 11-12
- ☐ "In-Depth" All-Day Tutorials. Advanced registration required.
- ☐ Monday, June 9 (includes lunch) \$295.00
Session # _____
- ☐ Tuesday, June 10 (includes lunch) \$295.00
Session # _____
- ☐ Full Four-Day Conference (includes lunch) \$690.00
Session # _____ # _____

All registrations include FREE admission to the Exposition.

NM/TC is brought to you by the Communication Networks show team and is managed by CW/Conference Management Group, a division of CW Communications/Inc., publishers of Computerworld and Network World

Please type or print:

Name _____

Title _____

Company _____

Street, P.O. Box _____

City, State, Zip _____

Telephone _____

Credit card billing is available. Call (800) 225-4698 or (617) 879-0700.
Registrations canceled later than May 30th are subject to a \$50.00 service charge. Registrations may be transferred at no charge.

CW2

quarter, then pause to evaluate its field performance. If all goes well, volume shipments will commence in late 1986.

Overall, 1986 is likely to be a year of modest financial accomplishments for Amdahl, with up to a 16% growth in revenue and a small increase in earnings. 1986 will be, however, a year of great strategic importance to the company. For during the current 12 months, Amdahl must lay the foundation for the rapid growth that it expects in 1987.

NAS President Dave Martin says, "I've never been more bullish" about his outlook for 1986 and beyond. "We'll beat our most optimistic schedule," he says.

Martin is alluding to the first customer shipment date of NAS' top-of-the-line XL mainframes. The company has already met its schedule with regard to its new double-capacity 7380 disks. NAS started shipping them in March, only eight months after the first customer shipment of IBM's 3380-E models.

NAS' long-term CPU plan is also bullish. During calendar year 1986, however, NAS can be expected to ship only about 40 to 50 of the new XL uniprocessors (100 to 110 in the fiscal year 1987).

Considering the performance advantages the XLs offer compared with the IBM 3090 Model 200s and the Amdahl 5890-300s, the above numbers suggest that NAS will be production constrained. Therefore, the effort needed to persuade NAS' Japanese partner Hitachi Ltd. to increase the output of its Kanagawa, Japan, CPU plant will be an internal marketing challenge that NAS will face in 1986.

COMPUTER INDUSTRY

Ashton-Tate revenue up

TORRANCE, Calif. — Ashton-Tate continued its record growth pattern, reporting a 72% revenue increase for the first quarter ended April 30.

Revenue at the second largest independent microcomputer software company was \$41.7 million, up from sales of \$23.9 million for the same period last year. The revenue increase includes an estimated \$7 million in sales from Multimate International Corp., which was acquired by Ashton-Tate in December.

First-quarter income increased 118% to \$5.1 million, or 47 cents per share, compared with \$2.3 million, or 25 cents, for the first quarter a year ago.

Ashton-Tate President Edward

Esber attributed the rapid revenue growth to high demand for its Dbase III Plus data base management system and increased sales of the Multimate product line.

Ashton-Tate completed the acquisition of Multimate, consolidating operations in sales and product management in its Torrance offices, while maintaining development, technical support and limited Multimate marketing activity in Multimate's East Hartford, Conn., headquarters.

During the quarter, Ashton-Tate raised \$47.7 million in a public offering of about 1.49 million shares of stock.

— Maura McEnaney

Creditors dispute value of STC

From page 146

not filed properly.

But the disagreement over the company's worth will not stop STC from meeting its self-imposed deadline for emerging from bankruptcy, according to observers. "STC has every reason in the world to get out of Chapter 11 as quickly as it can," said James Porter, publisher of "Disk/Trend News," a storage industry newsletter. "They need to rebuild the confidence level of their customers. After all, it's tough for a DP manager to buy from a bankrupt company."

It is also in the best interest of the creditors, many of whom have been

financially squeezed by frozen assets, to get STC out of Chapter 11 as soon as possible, Porter said.

In one of the largest bankruptcies ever to hit the computer industry, STC filed for protection from its creditors on Oct. 31, 1984. Until that time, the company was a leader in the mainframe disk drive and peripherals market, recording sales of \$1.1 billion in 1982. But under the direction of cofounder Jesse Aweida, STC sank millions into assorted development projects just as IBM began to take control of the storage market. By 1984, STC revenue had tumbled to \$808.5 million, and losses had climbed to \$505 million.

Poppa joined STC in January 1985. A seasoned veteran who has been at the helm of several other troubled companies, including Pertec Computer Corp., BMC Industries, Inc. and Mohawk Data Sciences Corp., Poppa first sold STC's \$30 million semiconductor facility to California Devices, Inc. for \$6 million. Not long after that, the company abandoned a multiyear \$140 million optical disk storage project.

"The problem at STC was pure management," Poppa said. "And it wasn't bad management necessarily, just overambitious management. Had they stayed to the base business,

Computer Industry section begins on page 146.

there never would have been any trouble at STC."

In the year since he joined STC as chairman, Poppa has pared STC to the bare bones. To build cash reserves, he closed or sold all but STC's core tape drive, disk drive and printer operations. In February, STC reported its first profitable quarter since 1983. It is this back-to-basics attitude, combined with the planned debut of a new cartridge tape drive, that has Poppa sure of STC's worth.

The cartridge tape drive with library capabilities, code-named Cimarron, is expected in October. With decreased inventories and regained customer confidence, STC expects 1986 revenue to hit \$725 million and earnings to reach between \$30 million and \$60 million, Poppa said.

And some analysts are optimistic about STC's viability. "STC could definitely come back and could be competition to IBM in the peripherals area," said Debra Silversmith of Hanifen, Imhoff, Inc. in Denver. "They've done a fairly efficient job of cost cutting, and top management has done a lot to reassure customers," she said.

Although STC has had "dozens" of purchase offers, "no one has been willing to pay what we think the company is worth," Poppa said. "They want to buy distressed merchandise, and we are not distressed."

Announcing

Computerworld's New MICRO DIRECT SHOPPER

An easy way for you to order micro products.

Now you can order microcomputer products directly from suppliers through Computerworld's new MICRO DIRECT SHOPPER.

Beginning with our May 26 issue, Computerworld's display classified section will include MICRO DIRECT SHOPPER, an all new section designed especially for companies that sell their micro products by mail or telephone orders.

This can mean a savings of money, time and energy in locating and acquiring the micro products that you need. MICRO DIRECT SHOPPER will appear preceeding the Buy-Sell-Swap section every week in Computerworld.

So be sure to watch for MICRO DIRECT SHOPPER starting May 26 in Computerworld. It's your ticket to truly convenient micro shopping. And it's now available in Computerworld.

COMPUTERWORLD

A PUBLICATION OF
CW COMMUNICATIONS

Announcing
Computerworld's
MICRO DIRECT SHOPPER

SEE PAGE
125



We edged out the competition with better solutions for every application.

Presenting the Tandy® line of PC-compatible computers

At Radio Shack Computer Centers, you won't find just any computer, you'll find the *right* computer.

America's #1 PC compatible

Looking for a complete, low-cost MS-DOS® system? The Tandy 1000 is compatible with the IBM® PC, so there are thousands of programs for you to choose from. Plus, the 1000 comes complete with its own Desk-Mate® 6-in-1 software for word processing, spreadsheet analysis, electronic filing, telecommunications, an appointment calendar and electronic mail.

The PC/XT's "mirror image"

The Tandy 1200 works like an IBM PC/XT—but costs much less. The 1200 runs the same top-name software and supports the same hardware as the PC/XT. Of course, this is great news for the first-time user. And if you're already using one or more IBM PC's in your office, the Tandy 1200 lets you expand for less—and continue using the same

quality MS-DOS software and expansion boards that you've been using.

The graphics advantage

Searching for a high-powered computer with advanced graphics capabilities? Take a good look at the affordable Tandy 2000. The Tandy 2000 gives you the high-resolution graphics you need to create razor-sharp graphs and diagrams in a brilliant array of colors. Combined with our computer-aided design (CAD) software graphics and peripherals, the Tandy 2000 offers mini-computer performance at an exceptionally low price.

The powerful Tandy 3000

This amazing computer is the affordable alternative to the IBM PC/AT. The Tandy 3000 has the power you need, and it's compatible with PC/AT and PC/XT software. And with the forthcoming XENIX® 5.0 operating system, two to six people will be able to use the Tandy 3000 simultaneously. Low-cost data terminals can have instant access to the 3000's speed and storage.

Tandy . . . Clearly Superior

Discover the power and affordability of the Tandy 3000 and all of our MS-DOS computers. Drop by your local Radio Shack Computer Center today, or send for our free 1986 Software Reference and Computer Guide.

Available at over 1200
Radio Shack Computer Centers and at
participating Radio Shack stores and dealers.

Radio Shack®
COMPUTER CENTERS

A DIVISION OF TANDY CORPORATION

Send me an RSC-16 Computer Catalog.

Radio Shack, Dept. 86-A-1057
300 One Tandy Center, Fort Worth, TX 76102

Name _____

Company _____

Address _____

City _____

State _____ ZIP _____

Phone _____

DeskMate/Registered TM Tandy Corp. DeskMate telecommunications require modem. IBM/Registered TM International Business Machines Corp. MS-DOS and XENIX/Registered TM Microsoft Corp.



Release the energy of networking for your business. Meridian* services let you share voice, data, text, and image as simply as you use a phone. Networking your information management tools into one cost-efficient resource gives you a competitive advantage. Ask for Meridian services, provided through Northern Telecom products. Available from phone companies and other suppliers of communication systems.



meridian

NETWORKING

GET SERIOUS



...ABOUT ANALYZING YOUR DATA.

You might be spreading your spreadsheet a little too thin. Or maybe you're starting from scratch. But if you're serious about data analysis, you're ready for SPSS/PC+™ — a full software family that brings you five high-powered ways to complete any data analysis task.

Enter it. SPSS/PC+ Data Entry™ — our latest option — takes the effort out of entering and correcting data.

Analyze it. The SPSS/PC+ Base Package provides a powerful array of statistical and reporting procedures.

Examine it. SPSS/PC+ Advanced Statistics™ lets you get more serious with your data.

Table it. SPSS/PC+ Tables™ produces presentation-ready tables instantly.

Chart it. SPSS/PC+ Graphics™ featuring Microsoft® Chart creates show-stopping graphs and charts.

SPSS/PC+ products are being put to productive use by serious fact finders in business, government and education. For countless purposes such as market research. Wage and salary studies. Survey analysis. And quality control. Plus each product is superbly documented and supported by SPSS Inc., a leader in statistical software for nearly 20 years.

So if you're serious about data analysis, step up to SPSS/PC+. For details, contact our Marketing Department.

CALL 1/312/329-3660

SPSS inc.

SPSS Inc. • 444 North Michigan Avenue, Suite 3000 • Chicago, Illinois 60611

In Europe: SPSS Europe B.V. • P.O. Box 115 • 4200 AC Gorinchem, The Netherlands • Telephone: +31183036711 • TWX: 21019

SPSS/PC+ runs on IBM PC/XT/AT's with hard disk. Contact SPSS Inc. for compatible microcomputers. SPSS/PC+, SPSS/PC+ Data Entry, SPSS/PC+ Advanced Statistics, SPSS/PC+ Tables and SPSS/PC+ Graphics are trademarks of SPSS Inc. for its proprietary computer software. Chart and Microsoft are trademarks of Microsoft Corporation. © 1986, SPSS Inc.

Semiconductor group maintains positive business outlook

Forecasts 16% growth in worldwide chip sales

By Maura McEnaney

SAN JOSE, Calif. — The U.S. semiconductor industry's trade group continues to maintain its positive business outlook, although to a somewhat lesser degree, by forecasting a 16% growth in worldwide semiconductor sales in 1986. The forecast is a revision of a September prediction anticipating an 18% increase in worldwide sales.

The mid-year forecast from World Semiconductor Trade Statistics, Inc., (WSTS) projects worldwide shipments to hit \$25 billion in 1986, climbing above 1985 sales of \$21.5 billion. The 1985 total represented a 17% drop from 1984 levels.

In the U.S., however, semiconductor shipments are expected to increase only 11.5%, from \$8.09 billion in 1985 to about \$9 billion. The revised U.S. predictions fall well below the September forecast of a 25% increase.

Regional sales will vary, the statistics show. In the Western European market, sales of semiconductors will grow 11%, from \$4.5 billion to \$5 billion, while the Japanese market will climb 25%, from \$7.6 billion to \$9.5 billion.

The numbers are somewhat skewed since they do not represent the increasing value of the Japanese yen, according to the Semiconductor Industry Association (SIA), publishers of the WSTS figures. "The real Japanese market will grow about 10% to 15%," says the SIA's Ione Ishii.

According to E. F. Hutton & Co. analyst Edward White, the currency differential makes for a much more modest forecast. "Generally the WSTS figures have been somewhat on the optimistic side, sometimes aggressively on the optimistic side," White says.

Only recently has the differential had an impact on the sales within the U.S., White notes. "The currency is going to increase U.S. world market share because Japanese company components are looking more expensive as the yen goes up," he claims.

In December, the market research firm Dataquest, Inc. predicted worldwide semiconductor sales would increase 9.8% over last year's totals, according to Dataquest analyst Sheridan Tatsuno. That forecast was later revised to 10% to 12% to address dumping margins after Japanese firms were hit with steep import duties. But with orders flattening, Dataquest is sticking to its original estimates. "We don't see a real big buildup for the rest of the year," Tatsuno says.

In April, Dataquest predicted a 28% growth in the Japanese market, but because it was listed in U.S. dollars, about 18% of that is owing to currency fluctuation, Tatsuno notes.

The fastest-growing technology in the chip industry this year will be the CMOS category, the SIA indicates. In 1985, sales of CMOS logic chips increased 17% to \$2.6 billion. WSTS estimates that shipments of CMOS chips will increase by 34% this year, 44% in 1987 and 42% in 1988.

ties show. In the Western European market, sales of semiconductors will grow 11%, from \$4.5 billion to \$5 billion, while the Japanese market will climb 25%, from \$7.6 billion to \$9.5 billion.

The numbers are somewhat skewed since they do not represent the increasing value of the Japanese yen, according to the Semiconductor Industry Association (SIA), publishers of the WSTS figures. "The real Japanese market will grow about 10% to 15%," says the SIA's Ione Ishii.

According to E. F. Hutton & Co. analyst Edward White, the currency differential makes for a much more modest forecast. "Generally the

WSTS figures have been somewhat on the optimistic side, sometimes aggressively on the optimistic side," White says.

Only recently has the differential had an impact on the sales within the U.S., White notes. "The currency is going to increase U.S. world market share because Japanese company components are looking more expensive as the yen goes up," he claims.

In December, the market research firm Dataquest, Inc. predicted worldwide semiconductor sales would increase 9.8% over last year's totals, according to Dataquest analyst Sheridan Tatsuno. That forecast was later revised to 10% to 12% to address dumping margins after Japanese

firms were hit with steep import duties. But with orders flattening, Dataquest is sticking to its original estimates. "We don't see a real big buildup for the rest of the year," Tatsuno says.

In April, Dataquest predicted a 28% growth in the Japanese market, but because it was listed in U.S. dollars, about 18% of that is owing to currency fluctuation, Tatsuno notes.

The fastest-growing technology in the chip industry this year will be the CMOS category, the SIA indicates. In 1985, sales of CMOS logic chips increased 17% to \$2.6 billion. WSTS estimates that shipments of CMOS chips will increase by 34% this year, 44% in 1987 and 42% in 1988.

YOUR GATEWAY TO THE PACIFIC MARKETPLACE



September 2 - 6, 1986 • RAS Showground • Sydney, Australia

AUSTRALIA AND THE PACIFIC BASIN COUNTRIES . . . A RAPIDLY GROWING MARKET OF USERS, BUYERS AND RESELLERS WHO REPRESENT AN OUTSTANDING NEW PROFIT POTENTIAL FOR YOUR COMPANY!

Only one show can connect you with every segment of the computer buying public in this dynamic market. COMDEX/Australia — your link to a whole new world of opportunity.

IF YOU MANUFACTURE OR DISTRIBUTE:

- | | | | |
|------------------|----------------------------|---------------------------|--|
| • Minicomputers | • Modems | • Network Services | • Memory Storage Devices |
| • Microcomputers | • Computer Furniture | • Third Party Maintenance | • Voice Response Systems |
| • Multiplexers | • CAD/CAM Systems | • Software | • or any other computer related product or service . . . |
| • Printers | • Communications Equipment | • LANs | |

COMDEX/Australia will put you in touch with the decisionmakers who specify and buy your products.

COMDEX/AUSTRALIA FEATURES:

- A five-day Conference for computer and communications professionals
 - A "private show" viewing opportunity for resellers.
- Exhibition of state-of-the-art computers and communications products and services
 - Exhibition of PCs and software for business, home and education.

ACT NOW!

Don't miss this opportunity to gain a foothold in many of the world's fastest growing computer markets. Reserve your prime exhibit space at COMDEX/Australia today. Call or write for information.

COMDEX⁸⁶ AUSTRALIA

U.S. Office:
The Interface Group
300 First Avenue
Needham, MA 02194
USA
(617) 449-6600

Australia Office:
8 West Street
North Sydney
N.S.W. 2060
Phone: 61-02-959-5555

European Office:
The Interface Group
World Trade Center
Tower C 12th Floor
Strawinskylaan 1245
1077 XX Amsterdam
The Netherlands
31-20-621941

Tokyo Office:
Kashiwabara Bldg. 2F
1-3-3, Kyabashi, Chuo-ku,
Tokyo 104, Japan
81-03-271-0246



Compugraphic Corp. reported net income of \$1.2 million, or 15 cents per share, on revenue of \$86.9 million for the quarter ended March 29. This compares with net income of \$5.5 million, or 66 cents per share, on revenue of \$107.5 million reported the previous year.

LSI Logic Corp. announced revenue for the first quarter ended March 31 of \$45.4 million, up 47% from \$31 million reported one year ago. Profits were \$2.7 million, or 7 cents per share, compared with \$1.5 million, or 4 cents per share, in the like period a year ago.

Priam Corp. reported revenue for the third quarter ended March 31 of \$36.2 million, compared with \$29.2 million one year ago. Profits were \$2.5 million, or 10 cents per share, compared with a net loss of \$4.8 million, or 21 cents per share, in the comparable period a year ago.

Quantum Corp. announced revenue for the year ended March 31 of \$121.2 million, compared with \$120.3 million in the previous year. Profits for the year were \$22.2 million, or \$2.30 per share, compared with \$21 million, or \$2.19 per share, in the like period a year ago.

In the fourth quarter ended March 31, revenue was \$27.7 million, compared with \$33.1 million a year ago. Profits were \$6.9 million, or 71 cents per share, compared with \$6.1 million, or 63 cents per share, in the comparable period a year ago.

Archive Corp. posted revenue for the second quarter ended March 28 of \$20.6 million, compared with \$13.1 million a year ago. Profits for the quarter were \$1.4 million, or 12 cents per share, compared with \$58,000, or 1 cent per share, last year.

"The #1 place to recruit qualified computer professionals nationally is Computerworld."



Robin Schwartz
Employment and
Employee Relations Manager
McCormack & Dodge
Natick, MA

Robin Schwartz is Employment and Employee Relations Manager for McCormack & Dodge, a software company based in Natick, Massachusetts. She is responsible for recruiting people for the company's home office as well as its seven regional offices across the country. And earlier this year when Robin was looking for software applications sales and support people, she chose to run an ad in Computerworld.

"I had numerous openings for positions across the country. From a cost-efficiency standpoint, Computerworld seemed like the logical choice," says Robin. "But before finalizing my decision, I did a little investigating. I talked to our sales managers here at McCormack & Dodge — and they all agreed. The #1 place to recruit qualified computer professionals nationally is Computerworld. To keep in touch with what's going on in the industry, people have to read Computerworld," she explains.

McCormack & Dodge is enjoying national visibility as a result of the ad, but, more importantly, Robin is quite pleased with the responses. "My people were right. We placed the ad in the beginning of the year and received tremendous response via our two-day hot line (800 number). And since we are still getting resumes, Computerworld obviously has a long life cycle through its pass-along circulation," she adds.

"The quality of the responses has made our ad placement more than worthwhile," concludes Robin. "The professionals responding to our ad are experienced, not just job changers. We are getting in touch with just the people we need to reach." In fact, according to Robin, "Quite a few of the positions are already filled. Thanks to Computerworld!"

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Robin.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700



MICRO DIRECT SHOPPER

GREAT SOFTWARE AT MODEST PRICES

Some samples from our library of over 500 disks for the IBM PC and compatibles

Desk Organizer

A great pop-up helper, phone dialer, note pad, calendar, and calculator

☐ 405 Deskmate—More than a sidekick

\$6

Communications

☐ 310 Qmodem—fast with windows

\$6

☐ 212, 334 Set up a BBS system

\$12

Draw on your computer screen

☐ 344, 345 PC Key Draw (graphics req.)

\$12

Spreadsheet

☐ 199 PC-Calcul—simpler than Lotus

\$6

Powerful database management programs

☐ 5 PC-File III—Labels, forms, letters

\$6

Word processing

☐ 78 PC-Write, popular and powerful

\$6

☐ 388 100 form letters on disk

\$6

☐ 194 PC-Read, computes level of text

\$6

☐ 379 Wordstar utilities

\$6

☐ 480 PC-Outline, create an outline

\$6

Artificial intelligence languages

☐ 417 Prolog

\$6

☐ 148 XLISP—version of Lisp

\$6

☐ 398 ESIE, expert system generator

\$6

Games—The most interesting games on, or off, Earth

☐ 293 Arcade Games (color graphics req.)

\$6

☐ 390 Flight and others (graphics req.)

\$6

☐ 354 PC Jr. games

\$6

☐ 292 Spacewars, great on Hercules card

\$6

☐ 476 Patrick's Best games (mostly mono)

\$6

Recover lost files—File examine/repair utility (floppies only)

☐ 133 Ultra Utilities, similar to Norton's

\$6

DOS Help and explanations for the new user

☐ 254 PC DOS Help

\$6

☐ 403 Computer Tutor, learn PC-DOS

\$6

Housekeeping—Our favorite utilities

☐ 478 Hard disk utilities, WHEREIS and more

\$6

Unprotect popular software

☐ 414 Routines to disable copy protection

\$6

Financial

☐ 164 Cashtrac, personal finances

\$6

For more software than you ever thought possible.

☐ 350-page directory (disks 1-300)

\$8.95

☐ Supplement (disks 301-454)

\$3.95

PC-SIG Membership—Includes directory, supplement, newsletters, and more

☐ PC-SIG 1 yr. Membership (\$35 foreign)

\$20

Choose one ☐ Printed ☐ On disk directory

SPECIAL

Any 5 Disks plus Directory, Supplement and 1-Year Membership

Only \$39 (Reg \$50)

Most programs have documentation on disk and request a donation from satisfied users. Please add \$4 postage and handling per order (\$10 foreign)—California residents add state sales tax.

Total Enclosed \$_____

by ☐ Check ☐ VISA ☐ MC

Card No _____

Exp. date _____ Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

 To order call: 800-245-6717
In CA: 800-222-2996
For technical questions or local orders: (408) 730-9291
1030-D East Duane Avenue Sunnyvale, CA 94086
Dealer Inquiries Invited #158



“When we brought out the PC’s Limited AT™ with its 8 MHz option included, it was hailed as a technological breakthrough. And with 1024K RAM on the motherboard, serial and parallel ports built in, and the wide range of options we provide, it became a smash success at \$1,995.

Now we’re breaking the \$1,500 barrier for IBM PC-AT™ compatibility, with our new price: \$1,495. And remember, every PC’s Limited computer we sell comes with a 30-day Money Back Guarantee of your satisfaction.”

—Michael Dell, President

At \$1,495, the PC’s Limited AT includes an 80286-based system unit running at 6 MHz and 8 MHz (keyboard-switchable); 1024K RAM on the motherboard; 1.2 meg floppy-disk drive; combined floppy/hard-disk controller card; AT-style keyboard; 192-watt power supply; 2 serial ports and 1 parallel port; clock/calendar with battery backup; and 8 expansion slots. The unit has the same bus configuration as the IBM PC-AT. It runs all major software written for the IBM PC, PC-XT and PC-AT and carries a one-year Limited Warranty. We offer a wide range of options to complete your system.

XT-AT Compatibles

XT compatibles (SX) start at
\$ 695

XT 8 mhz *TURBO* (FX) starts at
\$ 768

Both systems complete w/ 640K RAM, 360K Drv., TTL Ambr, M-Grfx w/Par, AT style keys

AT 8 mhz compatibles (a286) start at
\$ 1465

w/ 1 Meg Ram, 360K Drv, TTL Ambr, M-Grfx

AT (a 286) w/1.2 Meg Drv
30 Meg (32ms) HD, EGA card & 14" Mon.
MS-Mouse, 2 Meg Ram. The works...
\$ 4100

ISHVAR Systems Warranty is 12 mo.

EGA card + 14" Mitsubishi Mon **\$ 820**

We also carry Hard-Disks, add-on cards, & Accessories

ISHVAR Technology
43571 Sierra Dr
Three Rivers, Ca 93271
(209) 561-3139

IBM PC/XT, PC/AT are trade marks of IBM Corp.
Call for terms. Price subject to change.

- SCREENIO 2.0 -

Realia COBOL screens are a snap with SCREENIO 2.0!

Buy Realia COBOL (\$995) and SCREENIO (\$400) from us and get \$100 off or a free Kedit.

Or, ask us for a FREE demo disk.

NORCOM
Post Office Box 897
Juneau, AK 99802-0897
(907) 780-6464
Telex: 5106014951 NORCOM

Qualified companies can try SCREENIO for free! Call us.

Wanted IBM PC XT AT

- Used or New Surplus
- No deal too large or too small - we do it all.

The Computer Traders, Inc.
2262 NW Pkwy., Suite L
Marietta, GA 30067
404-980-9233

TOSHIBA-IBM COMPATIBILITY

P341 P351 P321 P1340 P1351 P1350

Now you can make your Toshiba printer totally compatible with the IBM (and compatibles) in both text and graphic modes. IDT's IBM-Toshiba Printer Interface has Epson emulation with Toshiba quality.

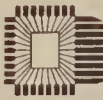
- memory resident software interface (compatible with most other memory resident packages)
- supports downloadable fonts even on P1340 and P1350
- prints IBM upper ASCII characters (borders, Greek, math, etc.)
- screen dumps both text and graphics
- complete graphics compatibility with most software
- font design capability
- versatility beyond compare - all in one program!

You can accomplish all this and more for only \$79.95 (\$2.50 shipping & handling) MC/VISA

INTEGRATED DATA TECHNOLOGIES, INC.
4775 Bunchberry Lane, Colorado Springs, CO 80917
ORDERS (303) 488-2583



SPECIAL OFFER:
Buy 1 interface and get IDT's FileManager disk utility for only \$19.95. (for a limited time only)



PC'S LIMITED

SALES CALLS OUTSIDE TEXAS, 1-800-426-5150
SALES CALLS INSIDE TEXAS, 1-800-252-8336
1611 Headway Circle, Building 3, Austin, Texas 78754
Sales Calls from anywhere in the country, (512) 339-6962
Technical Support Calls, (512) 339-6963 Customer Service Calls, (512) 339-6964
Telex No. 9103808386 PC LTD FAX(512) 339-6721

IBM is a registered trademark of IBM Corp. IBM PC-AT, PC-XT, and PC are trademarks of IBM Corp. Some quantities may be limited. PC's Limited sells equipment certified to be compliant with FCC Class B standards. All prices are subject to change without notice.

Hardware and software for the business PC.

✓ denotes IBM-AT compatibility.

SOFTWARE

We only carry the latest versions of products. Version numbers in our ads are current at press time.

Alpha Software	
✓Keyworks 2.0	\$49.
Ashton-Tate	
✓dBase III Plus 1.0	call
✓Framework II 1.0	call
Best Programs	
✓PC/Tax Cut (1986 version for 1985 taxes)	119.
✓PC/Fixed Asset System 3.1	299.
Bible Research	
✓THE WORD 3.0 (KJV Bible)	159.
✓THE WORD 3.0 (NIV Bible)	159.
Borland International	
✓Turbo Tutor 1.0	19.
✓Turbo Database Toolbox 1.2	33.
✓Turbo Graphix Toolbox 1.0	33.
✓Turbo Editor Toolbox 1.0	41.
✓Turbo Gameworks 1.0	37.
✓Turbo Newpak (Gameworks and Editor)	52.
✓Turbo Lightning 1.0	57.
✓Sidekick 1.5 (non-protected)	49.
✓Traveling Sidekick (req. Sidekick)	45.
✓Traveling Sidekick w/Sidekick	73.
✓Reflex 1.1	59.
✓Superkey 1.1	41.
✓Superkey/Sidekick Package	67.
✓Turbo Pascal 3.0	41.
✓Turbo Pascal 3.0 w/BCD	call
✓Turbo 8087 3.0	call
✓Turbo 8087 3.0 w/BCD	call
✓Turbo Holiday Pack (Pascal 3.0, Tutor, and Database Toolbox)	67.
✓Turbo Family Jumbo Pack (Pascal 3.0, Database, Editor & Graphix Toolboxes, Tutor and Gameworks)	135.
Breakthrough	
✓Timeline 2.0	239.
Broderbund	
✓Graphics Library 1	22.
✓Print Shop	35.
Dac Software	
✓Dac Easy Accounting 1.0	45.
Evergreen	
✓One Write Plus 1.01	159.
Executive Systems	
✓XTREE 2.0 (file & directory manager)	37.
5th Generation	
✓Fastback	97.
Funk Software	
✓Sideways 3.11	39.
Harvard Software	
✓Harvard Total Project Manager 1.0	285.
Infocom	
✓Cornerstone	85.
Lifetree	
✓Volkswriter 3	147.
Living Videotext	
✓ThinkTank 2.1	105.
✓Ready 1.0	49.
Micro Education (MECA)	
✓Managing Your Money 2.0	99.
Micropro	
✓WordStar 3.31	179.
✓WordStar 2000 Plus Release 2	299.
Microrim	
✓Extended Report Writer 1.2	85.
✓Clout 2.0	135.
✓R:base 5000 1.01	359.
Special! Get one R:base 5000 free from Microrim for every one you buy through June 30.	
✓R:base 5000 Multi-user	719.
Microsoft	
✓Multiplan 2.0	119.
✓Microsoft Word 3.0	247.
✓Windows 1.01	62.
✓Quick Basic 1.02	69.
✓Project 2.0	239.

Microstuf	
✓Crosstalk XVI 3.6	\$95.
✓Remote 1.3	95.
MultiMate International	
✓MultiMate 3.31	call
✓Multimate Advantage 3.6	269.
Nantucket Software	
✓Clipper	349.
Paperback Software	
✓VP-Planner	57.
Peter Norton	
✓Norton Utilities 3.1	59.
Quarterdeck	
✓DESQView 1.2	65.
Satellite Software	
✓WordPerfect 4.1	239.
Software Group	
✓Enable 1.1	call
Software Publishing	
✓PFS:Report B:01	77.
✓PFS:File B:01	84.
✓PFS:Write C:01	84.

TRAINING

ATI	
SKILL BUILDER PROGRAMS	
Intro and How To Use:	
Data Bases	MS-DOS
Compaq	PC-DOS
IBM-PC	BASIC
..... each 33.	
TRAINING POWER PROGRAMS	
How to Use:	
dBase II	dBase III
Lotus 1-2-3	
Multimate	Framework
Displaywrite 3	
Multiplan	Wordstar
Wordperfect	Symphony
..... each 43.	
Individual Software	
✓The Instructor II	35.
✓Professor DOS	47.
✓Tutorial Set (both items above)	75.
✓Typing Instructor	39.
✓Training for Lotus 1-2-3	49.
✓Training for dBase III	49.
✓Training for Project Management	49.

HARDWARE

AST Research	
All AST Boards come with a full one year warranty.	
SixPakPlus 64k upgradeable to 384k, with clock calendar, serial & parallel ports & now includes Sidekick version 1.5 non-copy protected & DESQView (game port opt.)	
SixPakPlus 384k (fully populated)	235.
✓AST-5251-11	279.
✓AST-3780	579.
✓Reach Modem half card 300/1200 baud internal modem includes Crosstalk XVI	329.
✓Advantage 128k	369.
✓RAMpage! upgradeable to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS)	call
✓AT RAMpage! upgradeable to 2Mb	call
Amdek	
✓Video 310A mono monitor (amber)	159.
✓Color 722 - RGB (EGA compatible)	519.
Curtis	
ACCESSORIES	
✓PC Pedestal (for IBM Mono or Color)	27.
✓Portable Pedestal	36.
✓Printer Stand	18.
✓System Stand	19.
✓Universal System Stand	25.
✓Low Profile Tilt and Swivel Pedestal	25.
CABLES	
✓Smartmodem to IBM Cable	17.
✓Keyboard Extension Cable (3 to 9 feet)	27.
✓Extension Cables for IBM Mono Display	33.
SURGE SUPPRESSORS	
All surge suppressors have an on/off switch.	
✓Diamond (6 outlets)	29.
✓Emerald (6 outlets; 6 ft cord)	36.

✓Sapphire (3 outlets; EMI/RFI filtered)	47.
✓Ruby (6 outlets; EMI/RFI filtered; 6 ft cord)	55.
✓Command Center	123.
Epson	
✓LX-80 printer (80 column)	call
✓FX-85 printer (80 column)	call
✓FX-286 (136 column)	call
✓LQ-800 (80 column)	call
✓LQ-1000 (136 column)	call
Hayes	
✓Smartmodem 300	139.
✓Smartmodem 1200	389.
✓Smartmodem 1200B (w/Smartcom II)	349.
✓Smartmodem 2400	579.
✓Smartmodem 2400B (w/Smartcom II)	539.
✓Smartcom II 2.1 (software)	75.
Hercules	
✓Hercules Color Card (parallel port)	159.
✓Hercules Graphics Card (parallel port)	289.
Intel	
✓Above Board PC	call
✓Above Board AT	call
✓Above Board PS (w/clock, serial, parallel)	call
✓Piggyback board for AT	call
8087 (for IBM-PC & XT)	129.
8087-2 (works on 8 Mhz computers)	177.
80287 (for IBM-PC AT)	225.
Kensington Microware	
✓Masterpiece	94.
key tronic	
✓5151 keyboard (deluxe)	169.
✓5153 keyboard (with touch pad)	279.
Mouse Systems	
✓PC Mouse with PC Paint+	139.
✓PC Mouse with Ready	139.
✓PC Mouse with Dr. Halo II	139.
✓PC Mouse with Ready and PC Paint+	149.
NEC	
✓Multisync monitor (EGA compatible)	549.
Orchid Technologies	
Conquest Multifunction Board 8k upgradeable to 2Mb, fully supports LOTUS/INTEL expanded memory specification (EMS), includes clock calendar, serial port, and parallel port.	
PC Turbo 286e w/1 Meg	749.
Eccell Multifunction Board for the AT	
8k upgradeable to 1 Meg, fully supports LOTUS/INTEL expanded memory specification (EMS) and Error Correction Code (ECC), (serial and parallel ports optional)	
399.	
Paradise Systems	
✓Color Card	99.
✓Monochrome Card	109.
✓Color/Mono Card	149.
✓Modular Graphics Card	275.
Princeton Graphics	
✓MAX-12E Amber monochrome monitor	179.
✓HX-12 RGB monitor (690 x 240)	449.
Quadram	
Expanded Quadboard with clock calendar, parallel, serial & game port and and Quadmaster software.	
8k (upgradeable to 384k)	189.
384k (fully populated)	249.
Gold Quadboard 8k	387.
Silver Quadboard 8k	215.
✓Microfazer Printer Buffer (parallel) w/copy	159.
MP 64 (64k) upgradeable to 512k	369.
SMA	
PC-Documate Keyboard Templates available for:	
DOS/Basic 2.0-2.1	Supercalc 3
DOS/Basic 3.0-3.1	Wordstar
Lotus 1-2-3	Wordstar 2000
Symphony	Turbo Pascal
Framework	WordPerfect
dBase II	dBase III
Multiplan	each 12.
Toshiba	
All Toshiba printers listed are 24 pin dot matrix.	
✓P321 parallel printer (80 column)	519.
✓P351 parallel printer (136 column)	1089.

DRIVES

All drives are shipped with complete installation instructions.

IOMEGA	
✓Bernoulli Box 20 Meg w/PC2 card	\$2299.
✓10 Meg cartridge	48.
✓Bernoulli Box 40 Meg w/PC2 card	2999.
✓20 Meg cartridge	67.
Mountain Computer	
Hard Drive Card 20 Meg	call
PC Connection	
20 Meg Hard Drive Card	489.
Seagate	
20 Meg Internal Hard Drive (w/controller and cables)	449.
Toshiba	
PC, XT 360k Drive (5 1/4" half-height)	109.
✓AT 360k Drive (5 1/4" half-height)	117.

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board or any memory board	
150 nanosecond (set of 9)	15.
200 nanosecond (set of 9)	12.
Install memory upgrades & run diagnostics at time of board purchase only	
10.	
128k Memory Upgrade Set for IBM-AT System Board (9 chips piggybacked)	
39.	
256k Memory Upgrade Set for any IBM-AT memory board (9 chips)	
39.	

DISKS

DS/DD Disks for the PC & XT (40 TPI).	
10 disks per box.	
✓Maxell MD-2	19.
✓Verbatim Datalife	17.
DS/High Density Disks for the AT (96 TPI).	
10 disks per box.	
✓Fuji	27.
✓Maxell	34.
✓Verbatim	34.
✓Flip Sort (holds 75 disks)	
15.	
✓Floppyclene Disk Drive Cleaner (5 1/4")	
18.	

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for charge cards.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All shipments insured; no additional charge.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- COD max. \$1000. Cash or certified check.
- 120 day limited guarantee on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-3383 Monday thru Friday 9:00 to 5:30.

SHIPPING

Note: Accounts on net terms pay actual shipping.
Continental US: For monitors, printers, and drives, add 2% for UPS ground shipping. Call for UPS Blue or UPS Next-Day-Air. For all other items, add \$2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. **Hawaii:** For monitors, printers, and drives, actual UPS Blue charge will be added. For all other items, add \$2 per order. **Alaska and outside Continental US:** Call 603/446-3383 for information.*

1-800/243-8088



PC Connection
 6 Mill Street
 Marlow, NH 03456
 603/446-3383

For the IBM-PC (XT & AT) exclusively.



* DEFECTIVE SOFTWARE REPLACED IMMEDIATELY. DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION. SOME ITEMS HAVE MANUFACTURERS WARRANTIES UP TO FIVE YEARS. ALL ITEMS SUBJECT TO AVAILABILITY. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Jubilation

Word-a-holics unite!

Trying to decide which word processor to buy is like trying to decide which college to go to. The decision will change your life forever, but you may never know if it was the best one. Here are five tried and proven professional packages. They all have spell checkers. None are copy-protected. And hard drives are recommended for all. See PC Magazine 1/28.

MultiMate Advantage 3.6 with Graphlink and On-File \$269
Originally designed to emulate the WANG word processor, MultiMate is often referred to as the corporate word processor. It offers sophisticated networking capabilities, and, with two free-for-a-limited-time software programs (Graphlink and On-File), also has built in graphics and database.

Microsoft Word 3.0 with Outline \$247
With a mouse and a graphics card, Microsoft Word lets you move words around without touching the keyboard, and see what you got without squinting. Without a mouse or a graphics card it's still a powerful word-processor, with "Style Sheets" that simplify formatting, and a built-in outline program.

WordPerfect 4.1 \$239
We have a friend who writes for computer magazines. At one time or another he has used and reviewed virtually every major word processor. He now swears by WordPerfect and swears at all the others. Use this program for a while and you'll be able to touch type most of your commands with your eyes closed and your right hand tied behind your back.

WordStar 2000 Plus Release 2 \$299
WordStar has had some trouble shedding its image as the lumbering dinosaur of the microcomputer age. But hundreds of thousands of people use it. There are a lot of programs out there to back it up. And this new version gives it the same advanced features as any top-quality word processor. Even the control keys are starting to make some sense.

Volkswriter 3.0 \$147
Solid performance with a reasonable price continues to be Volkswriter's claim to fame. It's fast, and boasts one of the original what-you-see-is-what-you-get screens. With the new version's spell checker and more sophisticated print formatting, it is now able to compete functionally with the other high-end word processors. (Our new low price is pretty persuasive too).

HARD BARGAINS



A 20 Meg drive on an expansion card, that you can install in under 10 minutes? That features plated media and a 2K data buffer that makes reading time 300% faster than the XT hard disk? For under \$500? Go for it. We also have conventional hard drive packages—drive, controller board, cables, and installation instructions. A file and directory management

utility will make it much easier to keep all those DOS directories straight. 1 year warranty.

20 Meg DriveCard \$489
20 Meg Internal Package (PC/XT) \$449
20 Meg Internal Package (AT) \$569
XTREE File & Directory Management Software . . \$37

Chips

Fully tested, factory fresh 9-chip sets from the leading chip manufacturers, such as TI, Samsung, NEC, Hitachi, Oki, etc. All chips and chip sets come with complete instructions.

64K	\$12 ea. set
(200Ns)	
64K	\$15 ea. set
(150Ns)	
128k	
or 256k	\$39 ea. set
(150Ns)	

Bernoulli bombshell!

There are very few products that are bargains at \$2999—a fully equipped car, a fully-furnished condominium in Marlow, NH, and a fully-supported 40 Meg Bernoulli Box. Well we don't sell cars, and there are no condos in our hometown, but we do have Bernoulli Boxes. Both the 20 Meg and 40 Meg versions feature two 1/2 height drives with removable cartridges. We're an authorized Bernoulli service center.

Bernoulli Box 40 Meg	\$2999
Additional 20 Meg Cartridges	\$67
Bernoulli Box 20 Meg	\$2299
Additional 10 Meg cartridges	\$48
Bernoulli Care Kit	\$79

Mouse Bundle!



A lot of people will sell you a mouse. Some will even sell you a mouse with a software program thrown in. But we'll sell you the Mouse Systems optical mouse with the new PC Paint Plus software, and a copy of *Ready!*, the memory-resident program that organizes and outlines your thoughts. At the cheesy little price of \$149.

Mouse Triple Bundle \$149

Lotus look-alike.



Take Lotus 1-2-3 Release 1A. Add non-copy-protected backup disks, increased column width versatility, reduced RAM requirements, dBase and Lotus 1-2-3 file compatibility, and a lot of other features. Subtract a few hundred dollars from the price.

Buy VP Planner from us.

VP Planner \$57

Ability!



Over 600,000 sample copies of Ability were bound into the November PC World, so a lot of you have had the chance to check it out. Word Processing, Spreadsheet, Database, Graphics, Telecommunications, and Presentation! It was pretty exciting, but it cost \$239. Now a new company, Migent Software, has it, and we can offer this complete integrated package for just \$65!

Ability \$65

Disks

(10 per box)

IBM-PC disks Verbatim DataLife (DS/DD)	
(limited time offer! 12 disks for the price of 10)	\$17
IBM-AT disks (96-TPI)	
Verbatim DataLife	\$34
Maxell	\$34
Fuji	\$27
(Floppyclene (5 1/4" Head Cleaner)	\$18

Tip Sheet



Name: Erik Blom
Title: Sales Consultant

Specialties:
Ultimate Frisbee, all night cut-throat cribbage, skiing in June.

"Have you experienced Deep DOS? I don't mean FORMAT, DISKCOPY, and DIR. I'm talking about all those funny sounding utilities that you've ignored for the last several months or years. Like CHKDSK—very helpful in determining what is (or isn't) wrong with your disk. Or EDLIN, a primitive, but occasionally very useful word processor.

"Once you've been using a PC for a while you should go back and thumb through your DOS manual. You may stumble upon a few time-saving tricks. Besides, think how impressed your friends will be when you casually comment, 'Oh, EXE2BIN? I use it all the time to convert my .EXE files to .COM compatible form. Saves disk space, you know.' So, CHECKDOS.OUT already."

6 MILL STREET, MARLOW, NH 03456 800-243-8088 or 603-446-3383

PC CONNECTION

COPYRIGHT MICRO CONNECTION, INC. 1986 MICRO CONNECTION IS A TRADEMARK OF MICRO CONNECTION, INC. PC CONNECTION IS A REGISTERED TRADEMARK OF MICRO CONNECTION, INC. MARLOW, NH

MICRO DIRECT SHOPPER

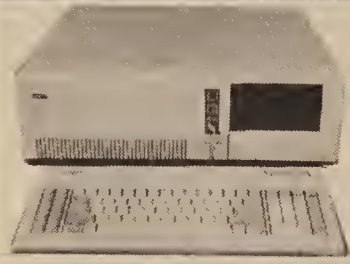
MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

Volume Supplier To Corporate Buyers...



STD-AT

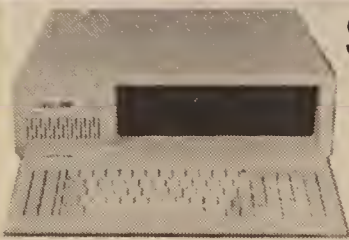
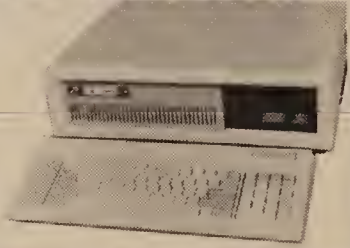
- Intel 80286 processor
- MS DOS 3.1 included
- 640K RAM on motherboard
- 1.2 MB Floppy Controller
- Dual floppy & hard drive controller
- Clock/Calendar with battery back-up

\$1549

STD-TURBO/XT

- Intel 8086 2 (4.77 or 2 MHz)
- Keyboard selectable clock speed
- Up to 40% faster processing
- STD-5160 AT style keyboard
- 640K RAM • 8 expansion slots
- 1-half height floppy drive

\$629



STANDARD PC/XT™

- Intel 8086 (4.77 MHz)
- 1-half height floppy drive
- STD-5150 keyboard
- 135 watt power supply
- 8 expansion slots

\$549

STANDARD MFC

Multifunction Card

384K Memory,
Serial & Parallel,
Clock/Calendar
Game Port

\$129

STANDARD MonoGraphics Card

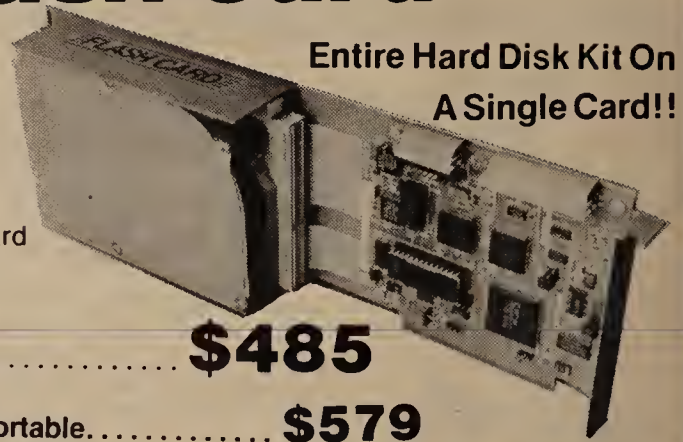
Monochrome
Graphic
Adapter
w/Parallel Port

\$99

Flash Card

Entire Hard Disk Kit On
A Single Card!!

- 3 1/2" hard disk
- Western Digital controller
- Installs in minutes
- Boots from Flash Card
- One Year Warranty

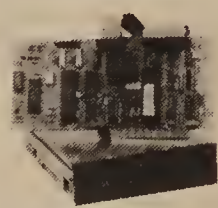


20MB for IBM PC..... **\$485**

20 MB for Compaq Portable..... **\$579**

Hard Disk Kits

...for IBM PC™

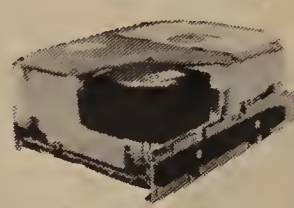


- Boots From Hard Disk
- Instruction Manual
- Cables & Mounting Hardware
- Half Height Bezel
- Hard Disk Controller

20 MB..... **\$415**

30MB..... **\$539**

...for IBM AT™



- 39 ms Access Time
- Boots From Hard Disk
- Uses AT Controllers
- Mounting Rails & Cables
- Instruction Manual

CMI 20MB..... **\$549**

CMI 30 MB..... **\$629**

...for Compaq
Portable



- Cables
- Instruction Manual
- Software
- 3 1/2" Shock Mounted Winchester Hard Disk
- Hard Disk Controller

20MB..... **\$579**



CALL TOLL FREE:
800-624-4031

In Texas Call: **512-331-6700**

Tech Support: **800-527-3125**

**PC
SOURCE**

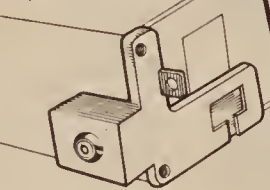
12303-G Technology

Austin, Tx. 78727

Our Policy: We accept MasterCard & VISA (with no surcharge!), money orders, certified checks, personal checks (allow 10 days for processing), COD (minimum purchase of \$50), Company/Institutional P.O.'s & wire transfers. We do not charge your card until we ship. We pay shipping (UPS ground, fully insured) on orders delivered in continental U.S.A. No warranty work done without proof of purchase. Add 6 1/8 sales tax if Texas resident. Prices are subject to change. All equipment carries a new factory warranty. Any return item must be accompanied by a return authorization number. IBM, PC/XT & AT are registered trademarks of International Business Machines.

STOP UNAUTHORIZED DATA ACCESS LOSS OF PERIPHERALS REMOVAL OF ADD-IN BOARDS SECURE YOUR COMPUTER IN MINUTES

STOPPER™ \$39.95
POWER SWITCH LOCK



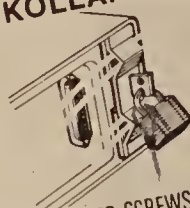
EASY OPERATION -
JUST TURN THE KEY
BLOCKS CRT PORT
SECURES SYSTEM COVER

CONFIDANTE™ \$99
DISKETTE AND DATA FILE
SECURITY
FILES AND DIRECTORIES ARE
ENCRYPTED
BACKGROUND MODE FOR EASE
OF USE
ON-LINE HELP

CONFIDE™ \$49

MENU DRIVEN
FILE BY FILE ENCRYPTION
SST OR DES ALGORITHM

PC/KOLLAR \$13.95
AT/KOLLAR \$17.95



BLOCKS COVER SCREWS
RESTRAINS PERIPHERALS
ALLOW ENTIRE SYSTEM TO BE
SECURED TO DESK

*Padlock & Cable optionally available

PHYSICAL SECURITY

APPLE II
MACINTOSH
DEC MICROS
LASER PRINTERS
TYPEWRITERS
MONITORS
and more!

Secure Systems Technology, Inc.
302 Southwest Avenue
P.O. Box 274
Tallmadge, Ohio 44278-0274
In Ohio (216) 633-8555
1-800-647-5580

KABLIT is a trademark of SECURE-IT

Call or write today for complete information!



COMPUTER SOLUTIONS
FOR YOUR BUSINESS

Specializing in AT&T Single &
Multiuser Systems

- UNIX/XENIX or DOS
- Customized Systems
- Manufacturing, retail point-of-sale, financial, etc.

AT&T COMPAQ IBM

FCG Information Systems Inc.
11033 E. Rosecrans Ave.
Norwalk, CA 90650
213-929-8891 CA 800-624-2499
Nat'l 800-523-1789

Repair PCs

AID/88 is a professional in-circuit tool used in repair of IBM PC and XT system boards... also 8088-based clones and adaptor cards. **\$2995**

DAIR

Computer Systems

3440 Kenneth Drive
Palo Alto, CA 94303
415 - 494 - 7081

MICRO DIRECT SHOPPER ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want. Micro Direct Shopper advertisers must offer to sell their products and services by mail or phone orders only.

Copy: We'll typeset your ad at no extra charge. Please attach clean typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Name: _____

Company: _____

Address: _____

Telephone: _____

Send this form to:

**COMPUTERWORLD
CLASSIFIED ADVERTISING**

Attn: Lisa Whittemore
375 Cochituate Road
Box 9171
Framingham, MA 01701-9171

PC TRAINING SUPPLIES



The #1 obstacle for new PC users is the keyboard. The PC KEYBOARD CHART allows users to quickly and easily understand the functions of the ARROW and SPECIAL keys. Erasable writing surface (free marking pen) allows you to label keys for your applications. Send 39.95 + 3.50 shipping (Calif. add 2.60 tax).

THE LEARNING CIRCUIT
4550 Hollywood Blvd., Suite 170
Los Angeles, CA 90027
VISA and Mastercard please call:
1-800-628-2828, Ext. 510

NEVER KNOWINGLY UNDERSOLD

At NDRC we specialize in top quality and bottom prices.

NDRC XT I/O
Serial, Parallel & Game ports,
clock/calendar, Ramdisk etc. **\$74.00**
NDRC Mono Card
Made by Toshiba full text card **\$43.50**
NDRC Mono/Graphics/Parallel **\$84.00**

TTL Green Monitor (IBM look-alike on swivel base) by MTR **\$129.00**
RGB Monitor by Thomson
Color, Text Green and Amber **\$299.00**
Texan 640 Monitor
640 x 400 Res, 0.31 dot pitch..... **Call**

8087-3 Maths Coprocessor **\$129.00**

20Mb Hard Drive by CMI
Fully tested 40 ms..... **\$299.00**

45Mb Streamer Tape Backup
Internals + controller + softw..... **\$499.00**

(Prices quoted FOB Dallas, Ship UPS)
Visa & MasterCard at 3%

N.D.R.C. (214) 750-9889

Computerworld's
Hottest New
Section

MICRO DIRECT SHOPPER

Get in on
the excitement!!!

For more information
call

1-800-343-6474
or in Mass.
(617) 879-0700

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

Teach your PC*
to print perfect bar codes



* & Big Graphics Characters
with Epson/Olddata/IBM Printers

PROGRAMS
Code 39, DOD LOGMARS, AIAG, GSA,
UPC, MSI/Plessey, 12 of 5, Plus 10 Sizes of
large Text Characters up to 1" tall

ASSEMBLER SUBROUTINES
BASIC, Turbo Pascal, Lattice C, MS-C,
Fortran, Clipper, dBASE III PLUS

READERS TOO!
PC, XT, AT, 3180, 5251, 5201, 3178, 3278,
RS-232, and PORTABLES

WORTHINGTON DATA SOLUTIONS
130 Crespi Court, Santa Cruz, CA 95060
408/458-9938

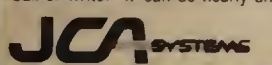
DATA ENTRY
SYSTEM FOR PC's

RODE/PC is the top-rated PC
data entry software. Fastest and
easiest to use. Extensive features
to meet every data entry require-
ment. Stand-alone and LAN
versions. High-speed data entry
keyboard available.

DPX, Inc.
20823 Stevens Creek Blvd.
Cupertino, CA 95014
(408) 973-9292

PAYROLL

Our proven, powerful Payroll does it ALL!
Up to 999 Comps, Deds, Benefits, Taxes, to
9,999 employees. Accrues sick, vacation, etc.
Distributes benefits by employee to multi-
departmental accounts. Multi-State. Integrated
with G/L, A/R, A/P. Site license, \$600
Novell & multi-company versions available. Set
up w/employees from \$100. Check or card
Call or write. "It can do nearly anything!"

JCA SYSTEMS
1200 Dupont Suite 2-E, Bellingham, WA 98225
(206) 647-2668
Hours 8:30-5:00 Pacific Time

IBM
REPAIRS

PC AT XT

One Day Service

Call Now
(305) 944-0042

DISK CONVERSIONS

Converting documents
is our specialty!
All formatting codes are
converted intact.
For further information
and a free test conversion
Call: 213/421-3055

CAMSON
A file conversion company
4148 Norse Way
Long Beach, CA 90808

9600 BAUD

Dial-Up

Error-Correcting
MODEMS

\$995

CALL (703) 620-3900 TO
ORDER YOUR UPTA 96 MODEM

ADD \$12.50 SHPG & HANDLING PER MODEM. ALL
ORDERS COD, PREPAID OR CREDIT CARD

• EVI/Fastcomm Data Corp. •
RESTON • VIRGINIA

THE PROFESSIONAL'S CHOICE

Lotus 1-2-3 \$319

Lotus Symphony \$449

dBase III Plus \$369

FrameWork II \$369

MultiMate \$219

Word Perfect 4.1 \$209

Software

Word Processing Editors

FANCY FONT \$119

FINAL WORD II \$219

MICROSOFT WORD \$239

MULTIMATE \$219

MULTIMATE ADVANTAGE \$269

OFFICE WRITER/ SPELLER \$239

PFS: WRITE \$ 89

SAMNA WORD III \$259

THINK TANK \$109

TURBO LIGHTNING \$ 59

VOLKSWRITER 3 \$159

VOLKSWRITER SCIENTIFIC \$259

WORD PERFECT 4.1 \$209

WORDSTAR 2000 \$249

WORDSTAR 2000+ \$289

WORDSTAR PRO \$259

XYWRITE III \$239

Database Systems

ALPHA DATA BASE MANAGER II \$179

CLIPPER \$359

CONDOR III \$339

CORNERSTONE \$259

DBASE III PLUS \$369

KMAN 2 \$269

PARADOX \$499

PFS: FILE/PFS: REPORT \$189

POWERBASE \$189

O & A \$199

QUICKCODE III \$159

QUICKREPORT \$159

R BASE 5000 \$359

REFLEX \$ 59

REVELATION \$499

Spreadsheets/ Integrated Packages

ENABLE \$349

FRAMEWORK II \$369

JAVELIN \$349

LOTUS 1-2-3 \$319

MULTILAN \$135

OPEN ACCESS \$259

SMART SYSTEM \$489

SPREADSHEET AUDITOR \$ 99

SUPERCALC 3 \$209

SYMPHONY \$449

Graphics

CHARTMASTER \$219

DIAGRAM MASTER \$199

EXECUVISION \$249

ENERGRAPHICS \$179

FREELANCE \$209

GEM DRAW \$149

GRAPHWRITER COMBO \$299

IN-A-VISION \$259

MS CHART NEW OVERHEAD \$189

EXPRESS \$139

PC DRAW \$209

PC PAINTBRUSH \$ 89

PFS: GRAPH \$ 89

SIGNMASTER \$149

Project Management

HARVARD TOTAL PROJECT MANAGER \$279

MICROSOFT PROJECT \$249

PROJECT SCHEDULER NETWORK \$339

SUPERPROJECT + TIMELINE 2.0 \$289

Communications/ Productivity Tools

CROSSTALK \$ 99

PROKEY \$ 85

KEYWORKS \$ 59

RELAY GOLD \$149

REMOTE \$109

SMARTTERM \$Call

SMARTCOM II \$ 99

SUPERKEY \$ 49

Statistics

SPSS/PC \$575

STATPAK-NWA \$299

STATPAC GOLD-WALONICK \$399

SYSTAT \$419

Desktop Environments

DESK ORGANIZER \$ 69

GEM DESKTOP \$ 39

SIDEKICK \$ 39

Network Applications

DBASE III LAN PAK \$599

KMAN 2 \$999

OPEN-SYSTEMS \$459

R BASE 5000 \$799

REVELATION \$999

WORD PERFECT \$450

Languages/Utilities

CONCURRENT DOS C86 C COMPILER \$179

FASTBACK \$299

LATTICE C COMPILER \$ 99

MARK WILLIAMS C \$269

MICROSOFT C COMPILER \$319

MS BASIC COMPILER \$249

MS FORTRAN \$249

NORTON UTILITIES \$229

QUICK BASIC \$ 59

TURBO PASCAL \$ 75

XENIX \$ 49

Accounting

BPI \$299

GREAT PLAINS \$479

IUS EASYBUSINESS \$309

ONE WRITE PLUS \$159

OPEN SYSTEMS \$159

PEACHTREE \$409

REAL WORLD \$259

STAR ACCOUNTING PARTNER II \$399

Display Boards

HERCULES GRAPHICS CARD \$299

HERCULES COLOR CARD \$159

PARADISE COLOR/ MONO \$169

PARADISE MODULAR GRAPHICS \$259

QUADRAM EGA+ \$379

SIGMA EGA 350 \$379

SIGMA COLOR 400 \$449

STB EGA PLUS \$399

TECMAR GRAPHICS MASTER \$489

TESENG ULTRA PAK \$429

TESENG ULTRA PAK-S \$369

Monitors

AMDEK 600/722 \$429/539

NEC MULTISYNC \$599

PRINCETON HX-12 \$449

PRINCETON MAX-12E \$179

PRINCETON SR-12 \$579

PRINCETON HX-12E \$539

PRINCETON HX-9 \$529

PRINCETON 122 AMBER \$159

TAXAN 830/840 \$469/539

Networks

AST PC NET \$Call

ORCHID PC NET \$Call

3 COM \$Call

Emulation Boards

AST 5251-11 + \$849

AST 5251-12 \$499

AST 5251-12 \$489

AST 5251-12 \$489

AST SNA \$599

CXI 3278/9 Plus \$849

IRMA \$799

IRMALINE \$999

Modems

AST REACH 1200 \$359

HAYES 1200 \$389

HAYES 1200B \$349

HAYES 2400 \$579

HAYES 2400B \$549

TRANSNET 1000 \$279

VENTEL 1200 \$389

HALF CARD \$319

WATSON \$319

Mass Storage/Backup

EXCEL STREAM 60 TAPE (INT) \$899

IOMEGA BERNOLLI BOX-10+10 \$2399

IRWIN 310A 10MB TAPE (EXT) \$850

IRWIN 110D 10MB TAPE (INT) \$479

MAYNSTREAM 60MB TAPE (INT) \$1199

MOUNTAIN DRIVECARD 20MB \$899

PLUS HARDCARD 10MB \$889

PRIAS 42MB AT \$1295

SYSGEN SMART IMAGE 20 MB (INT) \$625

TALL GRASS \$Call

TECMAR OIC-60AT TAPE (INT) \$1199

Input Devices

KEYTRONIX 5151 \$179

KOALA \$109

MICROSOFT MOUSE \$129

PC MOUSE W PAINTPLUS \$139

Accessories

CURTIS SURGE PROTECTORS \$Call

DATASHIELD BACKUP POWER \$Call

GILTRONIX SWITCHES \$Call

MASTERPIECE PLUS \$135

MICROFAZER INLINE BUFFERS \$Call

TRIPLITE BACKUP POWER \$Call

258K RAM SET \$ 39

8087 MATH CHIP \$135

80287 MATH CHIP \$199

Hardware *

Multifunction Boards

AST ADVANTAGE (128K) \$359

AST 8 PAK PLUS (OK) \$229

AST RAMPAGE PC \$319

AST RAMPAGE AT \$459

GOLD QUADBOARD (OK) \$419

INTEL ABOVEBOARD PS (64K) \$329

JRAM AT-3 (OK) \$239

JRAM 3 (OK) \$179

ORCHID CONQUEST (OK) \$279

ORCHID ECCEL (OK) \$459

PC TURBO 286 (OK) \$899

PC TINY TURBO 286 \$549

PERYST TIME SPECTRUM (384K) \$279

QUADBOARD (384K) \$249

SILVER QUADBOARD (OK) \$219

TECMAR CAPTAIN (384K) \$269

NEW NEC Multisync \$599

Mountain Drivecard 20 \$899

NEW Quadram EGA \$379

Princeton HX-12E \$539

J RAM AT-3 \$239

IRMA Board \$799

LOWEST PRICE GUARANTEE!!

We will match current nationally advertised prices on most products. Call and compare.

1-800-221-1260

In New York State call (718) 438-6057

Softline

Softline Corporation
P.O. Box 729, Brooklyn, N.Y. 11230
TELEX: 421047 ATLN UI
FAX: 718-972-8346

MasterCard VISA

MON.-THURS. 9:00AM-8:00 PM
SUN. & FRI. 9:00AM-4:00 PM

Custom Cables

Send for Catalog

RS232 • Parallel • 422
Coaxial • Dual Wang • 449
Twinaxial • Ethernet
Mod Plug • V.35 • Berg
Ribbon • Din • RCA
Connector Parts
Bulk Cable • Tools

Communication
Cable Company

P.O. Box 600, Wayne, PA 19087
215-644-1900

DATA ENTRY
EMULATOR

Full speed heads down data entry
with two-pass verification for the PC/
XT/AT and compatibles. Easy screen
formatting by your data entry operators
in minutes. Loaded with features like:
auto dupe and skip, verify bypass,
constant fields, range checks, table
lookups, full screen paging, and field
totals. Fully menu-driven only \$395.
Call for free 30 day trial period.

COMPUTER KEYES
21929 Makah Rd.
Woodway, Washington 98020
(206) 776-6443

NCC

DS/DD 55¢

Quantities of 100 or more

We also carry
8" diskettes
and AT Media

408 496-1022
1 (800) 245-3111

Larger Quantities Mean Lower Prices! Duplicating Services Available

National Computer Consulting Inc. • 3375 Scott Blvd. Suite 422 • Santa Clara, CA 95054

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

MICRO DIRECT SHOPPER

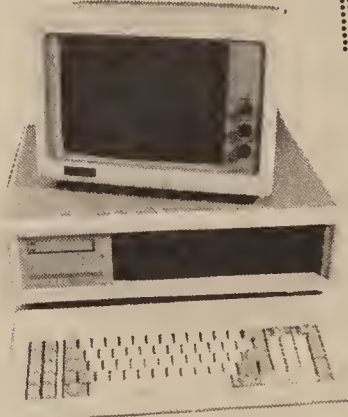
MICRO DIRECT SHOPPER

TCS

TEXAS COMPUTER SYSTEMS

Toll Free 1-800-433-5184 Texas 214-264-8511
Mail Order Computing Since 1980, D&B Rated

Why settle for 5 year-old design technology
when you can have the sensational 8 MHz



TCS TURBO PC

- 2 speed motherboard with keyboard selectable 4.77 MHz and 8 MHz modes.
- 640K memory on motherboard.
- 8 expansion slots.
- 135 watt power supply.
- 1 360 half-height floppy w/controller
- LED indicator lights and speaker.
- Beautiful high quality cabinet.
- 5150 style keyboard. 5151 Optional

Save
\$795
\$50 off this price
for cash in advance (cashier's check, MC/VISA).

Blaze along with up to 70% increase in processor speed over normal PCs. Yet, easily switch to 4.77 MHz when specialty programs require it. Runs all major IBM software in Turbo mode. One year warranty.

Orchid TINY TURBO 286 \$490

Supercharges normal PC/XTs to run faster than an AT.
Enjoy lightning AT speed with this super half slot sized accelerator.
Assures 100% IBM-PC compatibility by keeping 8088 processor in system to switch on when needed.

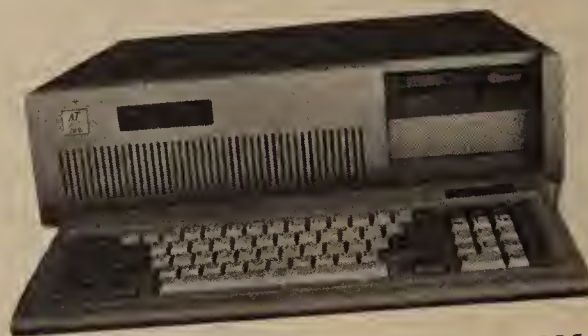
Panasonic 1080	\$225	Color Graphics Card	\$119
Panasonic 1091	\$239	Monochrome Card.	\$119
Panasonic 1092	\$359	Multifunction Card.	\$99
Panasonic 1592	\$430	I/O Clock Card.	\$99
Panasonic 3151	\$412	Everex Edge	\$239
		Graphics Solution	\$249

Heart of Texas Computer Systems, Inc. Box 531198 Grand Prairie, TX 75053
\$100 minimum purchase. Price/availability subject to change. Compatibility not guaranteed.
We accept MC, VISA, COD, Approved POs. AmEx add 3%. POs pay full shipping/handling.
Prepay cash discount available. Returns require RMA & are subject to restock fee.

TCS Turbo Business Computer

8MHz Turbo Speed. Compatible with the IBM-AT

\$1595



8 MHz. 33% faster than standard IBM-ATs.

- 80286 Microprocessor
- 1 mg. memory installed
- 1.2 mg. floppy drive
- Floppy/Hard AT controller
- 192 watt power supply
- 8 expansion slots
- Clock/calendar w/battery
- AT style keyboard
- AT style keylock cabinet
- Set-up software
- 13 month warranty

AT Multifunction Card . \$179
2 serial, 1 parallel ports. Will hold up to 2 Meg. of memory (2048K).

256K Memory. \$29
Set of 9 chips.

2 meg. (8 sets) \$232

Hard Drive Kits

Includes Seagate drive, controller, cables, and instructions.

FREE
with each Kit:
WindowDOS
Software!
Resident DOS
Utility gives
instant access
to DOS functions
from inside
your program.
A \$50 value.

10 meg. **\$399**

20 meg. **\$429**

Cashier's check, MC/VISA

\$449

COD, POs Net Terms

30 mg. **\$579**

360K Floppy Drives \$105
135 watt Power Supply \$85
150 watt Power Supply \$85
Emergency Power from. \$269
Modems (300-1200) from \$159
25 meg. MicroSystems MT25 Ext.
Tape Back-up System. \$849
20 meg. Internal Back-up. \$699

BUY - SELL - SWAP

Ask About Leasing!

call
800-828-4227
in Va. (703) 642-1950

CARLYN

COMPUTER SYSTEMS
5105Q BACKLICK ROAD, ANNANDALE, VA 22003

LEAS PAK INTERNATIONAL

**BEST PRICE
BEST SERVICE
BEST DELIVERY**

WHETHER YOU BUY, SELL, OR LEASE

PRINTERS AND CRT'S

S/34 AND S/38

SYSTEM 36 PROCESSORS AND DISK UPGRADES

LARGE INVENTORY

LEASE FINANCING

LEAS PAK INTERNATIONAL
ONE SOURCE SOLUTION

P.O. Box 759, Hurst, TX 76053 In Texas call 817/268-0023
1/800/LEAS-PAK

We Buy & Sell

DEC

Systems Components

call: 713
445-0082

Digital Computer Resale

600 Kennek Ste C22
Houston, Tx 77060

Two Year Lease
3081-G 24 x 24
Available May 15th, 1986

Sale Or Lease
4248-1
Available Immediately

Call Ext. 401
(800) 821-0229
(818) 986-2411
In California

El Camino Resources

NCC 1986

The National Computer Conference is the biggest and most important conference in the world and it is going to be held June 9th-12th, in Las Vegas, Nevada this year!

The NCC issues will have a readership of over 600,000 readers. With extra distribution at the show itself. This could be one of your smartest advertising moves of the year.

**PREVIEW - June 9th
SHOW - June 16th
WRAP-UP - June 23rd**

(617)879-0700
(800)343-6474
Telecopiers:
410 451

COMPUTERWORLD
Classified Advertising
P.O. Box 9171
375 Cochituate Road
Framingham, MA 01701-9171

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

**Providing
the BEST
a BETTER
WAY.**

**BUY • SELL • LEASE
S/34 • S/36 • S/38
43XX • 30XX
SERIES/1
NEW OR USED**

WE OFFER...

- PLUG COMPATIBLES • OEM
- COMMUNICATIONS EQUIPMENT
- AT&T • BURROUGHS •
- XEROX • PLUS...

COMPLETE FINANCIAL SERVICES

- ECONOCOM CONTINGENCY SERVICES (DISASTER RECOVERY PLANNING AND RECOVERY CENTERS FOR S/34-S/36-S/38)

- THE ECONOCOM LINE OF PLUG COMPATIBLES
- SERVICE PLUS! FROM ECONOCOM MAINTENANCE COMPANY
- PROFESSIONAL SERVICE
- COMPETITIVE PRICING
- FLEXIBLE FINANCING
- QUICK DELIVERY
- SHORT TERM LEASING
- LONG TERM LEASING
- PERIPHERAL LEASING
- TRADE-INS ACCEPTED
- TAKE-OUTS DONE
- MAINTENANCE GUARANTEE

At ECONOCOM-USA, we provide you with the BEST products and services available today...a BETTER WAY. Please contact our office nearest you for specific examples.

ATLANTA (404) 399-0732	DALLAS (214) 751-0100	LOS ANGELES (714) 852-0831	ORLANDO (305) 767-9416
BIRMINGHAM (205) 823-6568	DENVER (303) 893-1511	LOUISVILLE (502) 589-1376	RALEIGH (919) 544-6305
BOULDER (303) 449-1958	HOUSTON (713) 789-0800	MEMPHIS (901) 767-9130	TULSA (918) 493-5015
CHARLOTTE (704) 523-5508	KANSAS CITY (800) 238-3098	MIAMI (305) 755-4949	
CHATTANOOGA (615) 624-0976	LITTLE ROCK (501) 224-6242	NASHVILLE (615) 386-7019	

IN ADDITION, THE ECONOCOM CORPORATION HAS 31 OFFICES THROUGHOUT EUROPE.



ECONOCOM-USA, INC.
845 CROSSOVER LANE
MEMPHIS, TN 38117
800-238-3098
OR 901-767-9130

USA



SEND US YOUR BUSINESS CARD AND WE'LL SEND YOU A COPY OF OUR CAPABILITIES BROCHURE, COMPUTER MARKET ADVISOR, SERVICE PLUS! BROCHURE AND ECONOCOM CONTINGENCY SERVICES PACKET.

Who do you call on first for your data processing and telecommunications needs?

CMI SPECIALISTS

**3081, 3083
3084**
FOR SALE
OR LEASE

**DEC/VAX
780's, 785's**
FOR SALE
OR LEASE

Encino, CA (818) 789-0113
Laguna Hills, CA (714) 951-3200
Sacramento, CA (916) 443-7511
Miami, FL (305) 442-2968
Tampa, FL (813) 228-7000
Atlanta, GA (404) 256-7942
Chicago, IL (312) 620-4400
Boston, MA (617) 367-5755

Absecon, NJ (609) 645-7282
Flemington, NJ (201) 782-3878
Monmouth Beach, NJ (201) 222-0750
Cleveland, OH (216) 292-8142
Lebanon, TN (615) 449-6633
Dallas, TX (214) 869-3111
Houston, TX (713) 780-7459

Vancouver, British Columbia
(604) 685-6196
Toronto, Ontario (416) 928-3400
Montreal, Quebec (514) 871-1121
Nyon, Switzerland Telex: 27209
Paris, France Telex: 214093
Frankfurt, West Germany
Telex: 4170499
London, England Telex: 848980

CMI
A Torchmark Company

CMI Corporation
CMI Financial Services Group
2600 Telegraph Rd./P.O. Box 2026,
Bloomfield Hills, MI 48303-2026
(313) 456-0000/TWX 810-232-1667 CMI CORP. BDHS
Member ASCD and CDLA

CALL

1-800-IBM® - USED

In California (714) 259-0200

IBM is a registered trademark of International Business Machines
Marshall Lewis & Associates is not affiliated with IBM

IF IBM MAKES IT,
WE CAN SAVE YOU MONEY

Series/1	• Top Savings
System/34	• Quick Delivery
System/36	• Short and Long-Term Leases
System/38	• All Models & Peripherals
4300 & Up	• New & Used

Marshall Lewis

& Associates, Inc.

1385 Warner Ave., Suite A
Tustin, CA 92680

Member Computer Dealers
& Lessors Association

P.O. Box 2010, Tustin, CA 92681

ML
& A

IBM UNIT RECORD EQUIPMENT DISK PACKS—DATA MODULES—MAG. TAPE—DISKETTES



SALE OR LEASE

IBM UNIT RECORD MACHINES

026-029-082-083-084
085-087-088-129-514
519-548-557-188

NEW & USED

DISK PACKS—DATA MODULES
2316-3336(1)-3336(11)-3348(70)
MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION
5633 W. Howard St.
800-621-3906

Chicago, IL 60648
(IL-312-647-0880)

maybe

YOU NEED 34, 36, 38, 4331-4381, SERIES 1
YOU NEED CRT'S, PRINTERS, DISKS, TAPES
YOU NEED A QUICK PRICE QUOTATION
YOU NEED TO UPGRADE
YOU NEED TO CONSIDER LEASING
YOU ARE TIRED OF WAITING
YOU NEED TO CALL US

WE BUY • SELL • LEASE
34 • 36 • 38 • SERIES 1 • 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES
SOFTWARE & DATA COMMUNICATIONS CONSULTING

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879

CB

COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
"SINCE 1974"

Member
AMERICAN
SOCIETY OF
COMPUTER
DEALERS

Want To Buy
Or Sublease

3380 Disks

All Models

Call Ext. 401
(800) 821-0229
(818) 986-2411
In California

El Camino Resources

**WANT TO
BUY:
SYSTEM 36
SYSTEM 38
SERIES/1**

OUR SALES DEMAND REQUIRES THAT
WE ACQUIRE SYSTEMS AND PERIPH-
ERALS GUARANTEED FOR IBM
MAINTENANCE. WE WILL PAY TOP
DOLLAR! CALL TODAY!

612 894-2200

**Valley Computer
& Financial, Inc.**

CDLA

12205 Nicollet Avenue, Burnsville, MN 55337

Buy • Sell • Trade

IBM • DG • DEC

(305) 392-2005

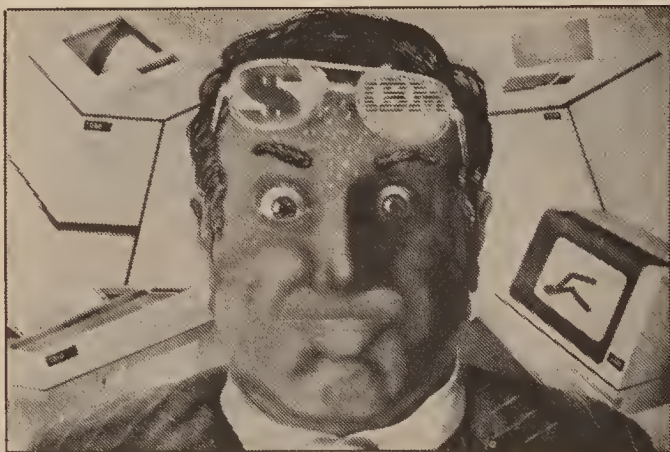


thomas business systems, inc.

4301 OAK CIRCLE • UNIT 11 • BOCA RATON, FL 33431

BUY SELL SWAP

BUY SELL SWAP



Don't Sweat It!

Call The Professionals for ALL Your IBM®
Buy / Sell / Leasing Needs

SYSTEMS

800-433-4148

PERIPHERALS



**DANA
MARKETING, INC.**

California 213 212-3111 Connecticut 203 359-8040 Texas 214 437-9018

BUY SELL SWAP



**DEC
HOTLINE
1-800-221-6318**

- ☒ **VAX**
M11, 730, 750, 780, 785
- ☒ **PDP II**
11/23, 73 11/34, 44, 84
- ☒ **PERIPHERALS**
Fixed & Removable
Drives, Tape Drives,
Communications
- ☒ **TERMINALS**
VT220, VT100, LA120,
LA210, LA50

UNBEATABLE
PRICING

INSTANT QUOTES

IMMEDIATE
DELIVERYNATIONAL
SERVICEDATAWARE
Your One-Stop DEC Source

1-800-221-6318

FREE CATALOG

Dataware

30 Bay St., Staten Island, N.Y. 10301
(718) 447-4911

DEC, VAX, PDP11 are registered trademarks of Digital Equip. Corp.

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the
CDPA, 301 N. Lamar St., 301 Building, Suite
508, Jackson, MS 39201 for the following
data processing equipment and services:

Request for Proposal No. 1111, due Tues-
day, June 10, 1986 at 3:30 p.m. for the ac-
quisition of a package to perform Contour Map-
ping, Gridding, and 3-Dimensional Analysis to
run on an IBM PC XT, AT or compatibles for
the MISSISSIPPI RESEARCH AND DEVEL-
OPMENT CENTER.

Request for Proposal No. 1112, due Mon-
day, June 9, 1986 at 3:30 p.m. for the ac-
quisition of a host access control package with a
minimum C-1 DOD security classification to be
resident on an Amdahl 5868 in a MVS/XA,
CICS and TSO environment for the STATE
CENTRAL DATA PROCESSING AUTHORITY.

Request for Proposal No. 1113, due Thurs-
day, June 19, 1986 at 3:30 p.m. for the MIS-
SIS-SIPPI STATE UNIVERSITY, Department of
Electrical Engineering to acquire a multi-
tasking 32 bit engineering workstation capa-
ble of running Silvar-Lisco and Mentor graph-
ics, and requiring compatibility with an
existing EtherNet gateway with TCP/IP.

Request for Proposal No. 1114, due Thurs-
day, June 19, 1986 at 3:30 p.m. for the UNI-
VERSITY OF SOUTHERN MISSISSIPPI, De-
partment of Computer Science and Statistics
to acquire a four workstation network of 32 bit
multitasking graphics workstations capable of
running AEGIS, and UNIX or equivalent oper-
ating systems.

Request for Proposal No. 1115, due
Wednesday, June 11, 1986 at 3:30 p.m. for
the acquisition of a distributed processing
minicomputer-based system for the MISSIS-
SIPPI BOARD OF NURSING.

Request for Proposal No. 1116, due Thurs-
day, June 12, 1986 at 3:30 p.m. to upgrade the
UNIVERSITY OF MISSISSIPPI MEDICAL
CENTER's existing IBM 4381 mainframe and
IBM 3380 technology disk storage subsys-
tem.

Request for Proposal No. 1117, due Tues-
day, June 24, 1986 at 3:30 p.m. for the ac-
quisition of a multiprogramming minicomputer
system for the Vocational/Technical Division
at MISSISSIPPI DELTA JUNIOR COLLEGE.

Detailed specifications may be obtained from
the CDPA office. The CDPA reserves the right
to reject any and all bids and proposals and to
waive informalities.

Lisa Winstead or Colleen Downing,
State Central
Data Processing Authority
601/359-1395

**3704
3705 3725
BUY • SELL • LEASE**

Call Toll-Free
800 532-7532

In Minnesota Call 612/944-9161

Centron DPL Company
Member CDLA

BUY SELL SWAP

★ Buy ★ Sell ★ Lease
Up to 40% SAVINGS on

IBM. Displaywriters

Guaranteed Acceptable
for IBM Maintenance
FEATURES & UPGRADES
5215-5218-6361
SYSTEM /23 DATAMASTERS
6670 PRINTERS
5525 OFFICE SYSTEMS
5219-5253-5258
SYSTEM/34/36

CDB FINANCIAL, INC.

3520 DILIDO ROAD
DALLAS, TEXAS 75228
214-324-3491

Member: NOMDA-CDLA

BUY SELL SWAP

**LENCO ANNOUNCES...
COST REDUCTION**

**IBM PC/XT
Compatible Computers
\$895.00**

Features:

640K Internal Memory (Installed)
Monochrome Monitor
MS-DOS 3.1
360K Panasonic Floppy
8 Expansion Slots
Standard Keyboard
Users Manual

Options:

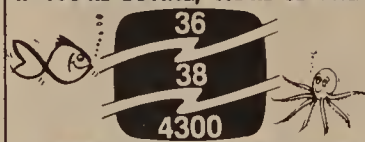
20 Mag Hard Disk \$595 (Installed)
100 Character Keyboard \$50

Guarantee:

1 Year Limited Warranty
FCC Approved

For Immediate Delivery Call
(617) 648-7559

IF YOU'RE BUYING, WE'RE SELLING.



IF YOU'RE SELLING, WE'RE BUYING.
IBM SYSTEMS Buy • Sell • Lease PERIPHERALS

(800) 331-8283

TOLL FREE

(213) 306-9343

CALIFORNIA

Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525
Playa Del Rey, CA 90293

**IBM.
HARDWARE
BUY • SELL • LEASE**

SERIES-1

S/34 • S/36 • S/38

S/23 • 4300 • POS

AMCOM

CORPORATION

5200 W 73RD ST

MINNEAPOLIS, MN 55435

612-835-4737 800-328-7723

Sale Or Lease

**3081
K32x24**

Call Ext. 401

(800) 821-0229

(818) 986-2411

In California

El Camino Resources

For Sale By End User

**Britton Lee
Database
Processor**

(1) IDM 200/0 With 1 Megabyte Of
Memory

(1) GPIB11-2 Interfaced For VAX

(1) IDM 500/0 With 1 Megabyte Of
Memory New

Make Offer

Jomico Metal Fabricators
(314) 869-3232

**The height of the year
in Computers.**

**And the height of
advertising exposure in
COMPUTERWORLD
Classifieds**

**THE
NATIONAL
COMPUTER
CONFERENCE**

You've got 3 chances to take advantage of it with us--- the
Preview Issue (June 9th), the Show Issue (June 16th) and
the Wrap-Up Issue (June 23rd). The NCC issues will have a
readership over and above our usual 600,000+ readers. It's
time to make one of your smartest advertising moves this
year.

Give us your advertisement. We have the classification to
cover it:

**Position Announcements
Buy - Sell - Swap
Software for Sale
Software Wanted
Time & Services**

**Bids & Proposals
Auctions
Publications
Seminars
Business Opportunities**

* The Bulletin Board
* Micro Direct Shopper

The open line rate is \$11.55 per line and the minimum ad size
is 2 column inches (1 column x 2" at a cost of \$323.40). Send
us camera-ready copy (*except for Bulletin Board and Micro
Direct Shopper) or copy to be typeset by us at no extra
charge. Enclose any logos, artwork, or borders that you want
to use in your ad. And if you are a first-time advertiser, please
send payment along with your ad.

* Space in the Bulletin Board and Micro Direct Shopper are
sold differently please call for further information/ rates.

Send all materials to Classified Advertising, COMPUTER-
WORLD, 375 Cochituate Road, Box 9171, Framingham, MA
01701-9171. For further information please call: 1-800-343-
6474, or in Massachusetts (617) 879-0700.

* NEW IBM SYSTEMS *

Delivery Positions — For Lease

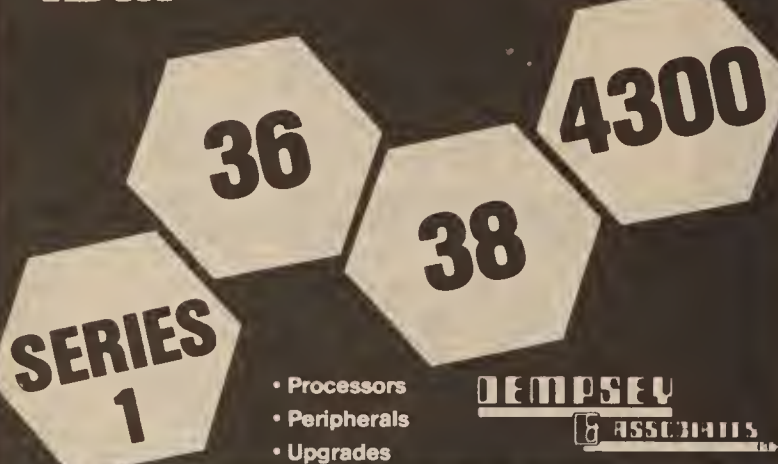
IBM Systems	Delivery Positions
3090-150	11-7-86
3090-180	7-25-86
4381-M11	8-8-86
4381-Q12	8-15-86
4381-Q13	8-22-86
4381-Q14	8-8-86

Call Mike-(313) 254-2850

48945 Van Dyke • Utica, MI 48087

CDLA

IBM BUY • SELL • LEASE



• Processors
• Peripherals
• Upgrades

DEMPSEY

ASSOCIATES

18377 Beach Blvd Suite 323 • Huntington Beach, CA 92648 (714) 847-8486

**Data General Users
IN NEW YORK, NEW JERSEY AND CONNECTICUT**



**DISASTER
RECOVERY
FACILITIES**

&

Facility Management Plans

FULLY MAINTAINED MV10000 AND MV8000 SYSTEMS,
COMMUNICATION NETWORKS TO ACCOMMODATE
HUNDREDS OF USERS, EXPANDABLE SYSTEM CAPABILITIES,
EXCLUSIVE OR SHARED EQUIPMENT USAGE RIGHTS.



**Systems Inc.
SALE, LEASE**

AND SERVICE OF

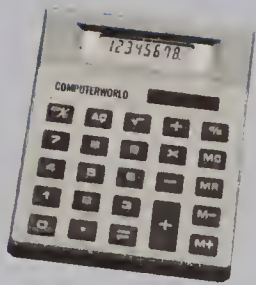
Data General EQUIPMENT

EAST COAST (516) 467-2500

NEW YORK 761 Coates Avenue, Holbrook, NY 11741, 516-467-2500 Telex #510-222-0882
CALIFORNIA 2322 Fifth Street, Berkeley, CA 94710, 415-848-9835

Order your own subscription to COMPUTERWORLD

And get this Desk Top Solar
Calculator FREE with your
paid subscription!



Plus, you'll get a bonus
with your subscription — the
COMPUTERWORLD FOCUS issues.
Each issue deals in depth with such topics as
Software, UNIX™, Communications, and more.

Just complete the attached order form and mail
it in this postage-paid envelope. Or call 1-800-
544-3712* for faster service.

* In PA call collect 215 768-0388.
Unix is a trademark of AT&T Bell
Laboratories.





NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT

COMPUTERWORLD

P.O. Box 1016

Southeastern, PA 19398-9984



BUY SELL SWAP

THE
SOURCE
FOR
series/1

ECONOCOM

• BUY • SELL
• LEASE
NEW OR USED

ECONOCOM-USA, INC.
845 CROSSOVER LANE
P. O. BOX 240297
MEMPHIS, TENNESSEE 38124
(901) 767-9130 or
(800) 238-3098

CDLA

Member
Computer Dealers
& Leasing Association

AEL

AMERICAN
ASSOCIATION
OF EQUIPMENT LEASERS

BUY SELL SWAP

IBM SPECIALISTS

SELL • LEASE • BUY

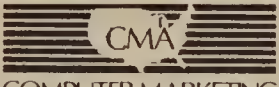
S/34 S/36 S/38
3741 3742

• New and Used • IBM Maintenance Guaranteed
• All Peripherals • Immediate Delivery
• Upgrades and Features • Completely Refurbished

800-251-2670
IN TENNESSEE (615) 847-4031

ascd

MEMBER
AMERICAN
SOCIETY OF
COMPUTER
DEALERS


COMPUTER MARKETING
of America, Inc.

P O BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

BUY SELL SWAP

THE COMPUTER
LEASING
HOT LINE:
800-243-5307

(In CT. call 203-661-4200)

You don't have to wait. Call us now for the best rates going on IBM systems . . . from 4381's to 3090's and everything in between. Ask for Thomas McShane.

Randolph

 Randolph Computer Corporation 
Subsidiary of Bank of Boston • 537 Steamboat Road, Greenwich, CT 06830

BUY SELL SWAP

BUY SELL SWAP

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease Buy • Sell • Lease

PRIME

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
2001 EAST CAMPBELL AVE.
PHOENIX, ARIZONA 85016
(602) 957-0999
ASK FOR DON OR MATT

TSI - the oldest, largest and most experienced supplier of third party peripherals, memories and controllers for Prime users.

BUY • SELL • LEASE • RENT

NATIONAL 800-222-DISK
FLORIDA 800-421-4135

Timesharing Services, Inc., 4080
Woodcock Dr., Jacksonville, FL 32207

MEMORY BOARDS
Superior Quality

4MB\$4,995
3MB\$4,795
2MB\$3,995
1MB\$2,495

Call for brochure
CYBERSYS, INC.
(313) 996-1848

DEC

FIRST ON DEC
FOR SALE

DEQNA-M\$ 875
DEUNA-AA 2,800
DFO3-RC 475
DFM16-AC 3,600
DMP11-AD 2,975
DR11-W 1,350
H9652 MA 2,450
LA120 BA 1,250
MICROVAX II's CALL
PRO350 D2 2,700
RA81-AA 12,500
RA81-ED 42,000
RP07-AA New 12,000
RUA81-EA 45,920
VT220 New 745
VT240 1,680
VT240 DEMO 1,075

WE ALSO BUY VAX HARDWARE!!

CALL

(800) 222-ICEX
(303) 666-5400

ICEX, INC.
740C SOUTH PIERCE AVE.
LOUISVILLE, CO 80027

DEC

Merida Trading Group
New

RA81AA\$12,500
RA60AA\$12,500
RA81JA\$52,000
750 Memory\$1,450
780 Memory\$1,450
MS11TB\$1,300
VAX 750 CPU Used Call
VT220 A, B & C Recon. \$750
Used 750/780

Memory\$1,000
H9642 Cabinets (2) ...\$1,000

155 New Boston Street
Woburn, MA 01801
(617) 933-6790

DEC SALE OR LEASE

VAX
DISK TAPE
TERMINALS

Available Off-Lease

VAX Systems
8600, 785, 780

Call Bill Miller
Vargo Company
(313) 254-2850

CDLA DDA

DEC SPRING SPECIALS

11/34A CPU Set\$750
11/44 CPU Set KD11Z\$3,900
DL11-W\$185
FPF11\$475
FP11A\$695
HSC5X-BA\$4,450
KK11-A\$475
MF20-M\$4,400
MS11-LD\$375
MS11-MB\$375
MS630-BA\$2,900
MSV11-PL\$695
VAX 4MB MS780-JD\$5,900
VAX 4MB MS86-BA\$11,300

Call Ray at QEI, Inc. (817) 275-6800

DEC NEW & USED

BUY - SELL - EXCHANGE

Systems • Processors • Memory
Options • Peripherals • Modules

LAKWOOD COMPUTER CORP.
452 Link Lane
Ft. Collins, CO 80524
(303) 493-6406

DEC

LA120 (Recon.) \$795.
VT220 (New) \$825.
DECMate II (New) \$2295.
KDF11BA (New) \$425.
Digital Computer Resale
(713) 445-0082

VAX • PDP II • LSI

BUY/SELL NEW/USED

The Systems Specialist

DIGITAL BASICS INC.
3705 West County Road 42
Burnsville, MN 55337
(612) 890-1196

LOW MILEAGE 11/750

4 MB, FP-750, 2 RM05's
TE 16, DZ 11E (16 line) more
VAX/VMS License, Media, Doc.
FORTRAN ditto

Available now, can be seen
running in Detroit area.

By owner (313) 541-0535

BUY • SELL • TRADE

1170 CPU stKDJ11-AA MSV11-JC
11725 LA120-BA MSV11-PL
BC26V-50 MS11-PB MSV11-QA
BC26V-80 MS750-CA MSV11-QC
DZ11-DP MS780-CH RA81-AA
H7140-AA MS780-FA TU80-AA

NEW YORK COMPUTER EXCHANGE
(516)752-8666 (800)645-9109

MISC.

PHOTO COMPOSITION
PROCESSOR

RC PAPER AND FILM

LOG E PC13

WORKING CONDITION

\$3,000

CAROLE LILAWSKI
516-924-5533

NEW & USED
RAISED FLOORING

Immediate Delivery

Quality Installation

RAISED COMPUTER FLOORS

One Charles Street
Westwood, NJ 07675
(201) 666-8200
Telex #13-5076

MISC.

AIR CONDITIONER
FOR COMPUTER ROOM

MODEL:
LIEBERT CHALLENGER

CU49W USED 3 YEARS
\$1,000

CAROLE LILAWSKI
516-924-5533

IBM

S/34 . S/36 . S/38

Upgrades/Peripherals

Lowest Price

Call Collect (404) 475-7507
Datamarc Computer Sales
785 Branch Dr, Alpharetta, GA 30021

PRINT TRAINS

IBM 1416 & 3216

Bought - Sold - Lease

Repaired - Reconditioned

COMPU-ACT
COMPANY, INC.
(813) 863-2461

S/38 S/36 S/34

SERIES 1

BUY - SELL - LEASE

Systems, Peripherals & Upgrades

Source Data Products
408/425-7333 800/328-2669

34-36-38

Systems,
Peripherals & Upgrades

Guaranteed Quality Service

Special Reduced Prices

New and Used Equipment

Carlyn Computer Systems, Inc.
800-828-4227
In VA (703) 642-1950

Fox Computer Sales

Buy • Sell • Rent • Lease

DATAPOINT

W.T.B.: Used Equipment

(216) 449-5205

IBM

S/34 S/36 S/38

BUY - SELL - LEASE

Need Used 36's & 38's

Xerxes Computer Sales
800/328-3884
612/936-9280

IBM

3178, 3179,
3278, 3274

All Other IBM Units Available
Call Penny 800/426-4341
In CA 408/241-3677
Marketex Computer Corp.

FOR SALE

SYSTEM/36

5360 CPU Model A21 (30MB, 128K,
Magazine) and 5224 Model 2 Printer.

IBM List \$31K+
Buy for \$24K or Best Offer
(913) 749-3367
James Hamersly

SALE/LEASE

3380-AA4

3380-B4 3880-3

w/8170, 8171

Call Howard King (914) 238-9631
Computer Merchants Inc.

Want To Buy

System 38

System 36

(713) 627-7117

SALE/LEASE

4331-L2 4361-L5

Will Reconfigure
Peripherals Available

Call Bill Hegan
(914) 238-9631
Computer Merchants Inc.

S/38

Memory Upgrades

Immediately Available
EMC Or IBM
(713) 627-7117
(212) 279-4467

IBM

WANTED

S/38

Models 8, 20 Or 40

Call Ron Gibb
(914) 238-9631
Computer Merchants Inc.

For Sale Or Lease

3420-8

3803-2

Bluebonnet Computer Co.
(512) 926-3900

Sale/Lease

IBM 3180-210

\$1,795.

Call Philip Quinn
At Quinn Data Products
(800) 345-0314

HONEYWELL

HONEYWELL SPECIALISTS

LEVEL 6 DPS 6 SERIES 16

The Recognized Leader
In Honeywell Minicomputer
Sales And Support

• Complete Minicomputer Line - New
and Used
• All Peripherals and Terminals
• Upgrades and Features
• Depot Repair Capability
• Honeywell Maintenance Guaranteed
• Immediate Delivery - Low Prices
• Complete Refurbishment

617-393-6839
TWX 710-347-7574

Boudreau Computer Services

Since 1974

100 Bearfoot Rd.
Northboro, Massachusetts 01532

LEVEL 6 AND DPS6 USERS

NEW AND RENEWED ORIGINAL

Systems - Peripherals - CRT's
Memory - Controllers - Cables

Guaranteed Honeywell Maintenance

Large software staff

C.D. Systems Inc.
1-800-331-2310

The Bulletin Board

WANG

BUY - SELL
MVP/LVP • OIS • VS • PC
SYSTEMS IN INVENTORY
VS-45 • OIS • VS-100
GENESIS
EQUIPMENT MARKETING
GEM
(602) 277-8230

**THE RIGHT EQUIPMENT
RIGHT NOW
AT THE RIGHT PRICE
ICA..THE RIGHT CHOICE**

founded 1981 by ex-Wang employees
(404)977-4388 or (800)241-3159

Buy • Sell
Used
Wang Equipment
Guaranteed For Wang Maintenance
Holson Associates Inc.
2470 Windy Hill Road, Suite 253
Marietta, GA 30067
Call: Richard Holley
or Carole Benson
(404) 980-1700

WANG

**BUY IN CANADA
WHERE YOUR U.S.
DOLLARS GO FURTHER**

Systems and Peripherals
Buy and Sell World Wide
Norcomex, Ltd.
800-387-3613 (From U.S. Only)
416-738-0803 or 416-736-1059
Telex # 06986766 TOR

QANTEL

**BUY SELL LEASE
QANTEL
COMPUTER EQUIPMENT**

CALL PROMPT COMPUTER
Dan Kobie
(216) 248-2898

The Bulletin Board

HEWLETT
PACKARD

HP3000

BUY • SELL • RENT • LEASE
Processors • Peripherals • Systems

Memory Special
30161A
1 Mb Memory For S/4X
\$6,500.

Immediate Delivery
Subject to Availability
Guaranteed to Quality
for HP Maintenance

ConAm Corporation
(800) 643-4954 (213) 829-2277

HP 1000 • 3000

Systems & Peripherals
Buy & Sell Worldwide
ENCORE
(213) 452-9117
Telex 756927

HEWLETT
PACKARDHEWLETT PACKARD
1000 • 9000 • 3000

SYSTEMS & PERIPHERALS
BUY & SELL WORLDWIDE
EURODATA, INC.
(613)725-9485
Tlx: 053-3025

MISC.
SYSTEMS

Buy Sell
UPS Systems

Available For Immediate Delivery.
400 KVA, 20 Min. Battery \$55,000
500 KVA, 10 Min. Battery \$65,000
750 KVA, No Battery \$60,000
225 KVA, 15 Min. Battery \$45,000
Powrtec (216) 869-0693

The Bulletin Board

ORDER FORM

COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. Computerworld comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be clearly typewritten. Ads may be given over the phone to our team of ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is \$160.00 (One unit minimum and no fractional units allowed.) There are no agency commissions and no quantity discounts.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Issue Date: _____

Classification: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Send this form to:

COMPUTERWORLD BULLETIN BOARD

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
617-879-0700 800-343-6474

TIME & SERVICES

DATA CENTER
SERVICES

- ★ MILLENNIUM
- ★ OS/MVS/SP
- ★ VM/370
- ★ DOS/VSE/SCP
- ★ CMS
- ★ NOMAD2
- ★ TSO/SPF
- ★ CICS
- ★ IMS/DBDC
- ★ RJE
- ★ TELENET ACCESS

Info Center Products
Access By Micros

EXCELLENT SERVICE LEVELS
COMPETITIVE RATES
VOLUME DISCOUNTS

BURNS COMPUTING
SERVICES, INC.

MIDWEST: 312/981-5260
EAST COAST: 215/398-3600
212/432-1151

MILLENNIUM is a registered
trademark of McCormack & Dodge

NOMAD2 is a trademark of
DEB COMPUTING SERVICES INC

MVS - VM - DOS

**computer
time**

201-930-0051
212-921-8855

tbi

TIME BROKERS, INC.

CICS - TSO - CMS

DATA CONVERSION
LABORATORY
Savings To 90%

Save up to 90% on the cost of rekeying
data from disk or tape on incompatible sys-
tems. We transfer data between word proces-
sors, typesetters, micros, minis, mainframes,
and software packages plus optical scanning
of typed copy. Over 1000 formats.

We offer 100% text accuracy plus unbe-
lievable 99.8% format-transfer accuracy, com-
pared to 98% with most other services. That's
the difference between 1 to 2 format errors
per line, and less than 1 to 2 per page - be-
tween 10 minutes to correct a page, or just 15
seconds to check it! Guaranteed results.

• (718) 939-4921 •

SOFTWARE
FOR SALESOFTWARE
CONVERSION
SOLUTIONS

Dataware provides the software
translation system for your complex
conversion problems. Over 18 years
of conversion experience has
resulted in thousands of satisfied
customers, worldwide.

- COBOL to COBOL
- AUTOCODER/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- FORTRAN to FORTRAN
- PL/1 to COBOL
- RPG/RPG II to COBOL
- RPG/RPG II to PL/1
- DDS to MVS

Dataware offers services & software
to meet your needs. For more
information, call or write today.

**The Conversion Software People
Dataware, Inc.**
A Computer Task Group Company

3095 Union Road
Orchard Park, NY 14127-1214
Phone: (800) 367-2687
TELEX: 510-100-2155

SOFTWARE
WANTED

Turn Your Efforts Into \$\$\$

Wanted: Software. Successful software company seeking
additional products to market. Must run on IBM mainframes
or PCMs. Prefer programmer/operations productivity aids. If
you have written a program and you need an international
company to market it for you, send an abstract of the product
to:



J. Zipp, Triangle Software
4340 Stevens Creek Blvd.
Suite 275
San Jose, CA 95129
(408) 554-8121.

German Software company is looking for software
packages in the area of

VEHICLE PLANNING
and OPTIMIZATION
of TRANSPORTATION

We would like to distribute those packages in Germany,
Austria and Switzerland.

Please contact Mr. H. Heckl at Inforatio GmbH,
Postfach 204, D-7120 Bietigheim, West Germany

BIDS &
PROPOSALS

THE PORT AUTHORITY OF
NEW YORK AND NEW JERSEY
REQUEST FOR EXPRESSION OF
INTEREST & QUALIFICATION
NEW ENHANCED AVENUE AND
LOT INVENTORY CONTROL SYSTEMS FOR
PARKING LOTS
AT THE THREE MAJOR AIRPORTS

The Port Authority of New York and New Jersey seeks expressions of interest and statements of qualification from qualified vendors, manufacturers, system developers and system integrators regarding the system development, provision, implementation and operational support of new computerized parking lot revenue and lot inventory control systems for John F. Kennedy International, LaGuardia and Newark International Airports. These systems will incorporate state-of-the-art Automatic Teller Machine based pre-cashiering machines (automated teller machines being an example), optical license plate recognition systems and advanced technology mass storage and advanced data processing devices. A Request for Proposal (RFP) and/or contract will be sent to qualified firms. Additional qualification information may also be requested. To be considered for qualification, please write to R.M. Monti, Director of Engineering & Chief Engineer, One World Trade Center, Room 72 South, New York, NY 10048 before Monday, June 16, 1986.

Interested hardware and software vendors are invited to submit proposals on an Integrated Management Information System for the Albuquerque, New Mexico Public Schools.

The RFP # 86-209 will be released approximately May 22nd.

Please call or write Richard Ennes at 912 Oak Street SE, Albuquerque, New Mexico 87106. (505) 842-6801

Tell more than 687,000 computer-involved professionals with an ad in the Bids & Proposals what you have available

Call toll-free (800) 343-6474
or in Massachusetts
(617) 879-0700

DEC SPECIALISTS
VAX 8600 & PDP-11
TIME SHARING
NO CPU CHARGES

\$7/\$10

RSTS/E VMS
PER HOUR
CONNECT TIME

**BUDGET
BYTES**
212-
944-9230
EXT. 110

- ☐ TIMESHARING
- ☐ GENERAL CONSULTING
- ☐ SOFTWARE DEVELOPMENT
- ☐ FACILITIES MANAGEMENT
- ☐ COMPUTER EQUIPMENT & SUPPLIES
- ☐ HARDWARE MAINTENANCE (NY METRO AREA)
- ☐ MEDIA CONVERSION
- ☐ SOLOMON ACCOUNTING SOFTWARE

Omnicomputer, Inc.
1430 Broadway, New York, N.Y. 10018

LENCO ANNOUNCES
AUTOMATIC
TRANSLATIONS
BASIC TO C

Wang 2200 & Wang OIS Basic to C
DEC/RSTS Basic to C
MicroSoft Basic to C
IBM/Basic to C
Medium: IBM PC Floppy
800 or 1600 BPI Mag Tape
8" Wang Floppy Standard Format

Typical Turnaround 1 Week for
Clean Executable Code

Call For A Quote

LENCO
Computer Consultants
661 Mass. Avenue, Suite 25
Arlington, MA 02174
(617) 648-7559

ICOTECH

Innovative Computer Techniques
DATA PROCESSING SERVICES
IBM 3081 DEC-10 VAX 8600

- Batch Processing
- Timesharing
- Microfiche
- Public Network Access
- Laser Printing
- Optical Mark Reading

Introducing ...

**the ICOTECH
Health & Safety
Information System**

Route 202 • Raritan, N.J. 08869
201-685-3400 • Contact: Joyce Bogaenko

COMPUTER
TIMESHARING

- We broker computer time.
- All mainframes.
- Nationwide Service.
- NEVER a charge to the Buyer.
- Our fees paid by the Seller.

Call Don Seiden at

Computer Reserves, Inc.
(201) 688-6100

Data Products

LINE PRINTER
SPECIALISTS

Printer Repair, Supplies & Sales
T & M, Installation, Consulting
& Monthly Contracts Available

Let CSS Service
Your Printer Needs

Call Computer Support
& Supplies Inc (305) 488-4293
Centronix

POSITION ANNOUNCEMENTS

SYSTEMS AND PROGRAMMING MANAGER

American Bankers Insurance Group has an immediate opening for an experienced manager to direct Systems and Programming. As a leader in innovative insurance products, the corporation offers an exciting career to an applicant who can provide leadership and management in diverse application areas. The applicant must have proven credentials to include:

- a minimum of fifteen years experience in development and maintenance of data processing application systems.
- a minimum of seven years management experience in diverse applications to include projects as well as administrative management (insurance applications experience preferred).
- experience in hands-on design and development of on-line/batch systems.
- a minimum of a bachelors degree in a related field required. MBA or Masters in Computer Science preferred.

PRIMARY ENVIRONMENT:

- IBM, MVS/XA
- staff of over 55 analysts and programmers
- CICS/On-line/Batch COBOL Application Packages to include the following: PMS, MSA G/L, MSA A/R, MSA A/P, ISA Stocks and Bonds

This position is located in the Corporate International Headquarters in suburban Miami, Florida. In addition to an excellent financial package and benefits program, the corporation offers full relocation assistance. Please send a resume and salary history in confidence to:

Philip J. Sharkey
Vice President - Human Resources
American Bankers Insurance Group
11222 Quail Roost Drive
Miami, FL 33157
E.O.E.

WANTED

Data Processing Professionals

For A PRIME Information System

PROGRAMMER/ANALYST

We need a strong Applications Programmer with at least 3 years experience on Prime Computers to develop software on our Prime 9955 with the Information Operating System. Your responsibilities will include design and implementation of our new systems, enhancement of existing systems and interfacing with our documentation and communication personnel.

We offer a corporate commitment to leading edge technology, exciting R & D atmosphere, a great location to work and excellent benefits.

For prompt consideration, send your resume and salary history to:

Don Goehring
Skyway Systems, Inc.
P.O. Box 1810
Santa Cruz, CA 95061



DATA PROCESSING PROFESSIONALS

Participate in NEW developments utilizing on-line and DB technologies. Our Environment utilizes an IBM 308X running MVS, IJES2, CICS, ADS/O and IDMS. We have positions available in a variety of areas for individuals with appropriate experience. BSCS or equivalent preferred.

SYSTEMS ANALYST: Financial Applications/3

Background should include extensive systems development including 5 plus years experience with COBOL, VSAM, IDMS, ADS/O, MVS with exposure to PANVALET, SYSD, and systems methodology a plus. Requires familiarity with implementation of Cullinet software packages. Requires heavy user contact.

PROGRAMMER ANALYST: Financial Applications/3

Requires 3 or more years experience in financial programming applications using VSAM, COBOL, MVS, IDMS, ADS/O. Background in MSA, PANVALET, structure coding, SYSD, and other financial systems a plus.

PROGRAMMER ANALYST: Manufacturing Applications/6

Two plus years experience utilizing CICS, VSAM, COBOL, MVS, CICS or ADS/O or UFO. Design, code, test, install and support systems. Involves user contact and requires good communications skills.

SR. SYSTEMS & PROGRAMMER ANALYSTS/2

Positions will be user-oriented and support a variety of application areas. Candidates should have 2-5 years experience with some or all of the following: TSO/SPF, SAS, ARTEMIS, Graphics, GDDM, JCL, PL/1, CICS, IDMS and PC products.

SR. SYSTEMS ANALYST/8

Candidate will have project leader responsibilities; will participate and direct others on the design, development and implementation of manufacturing and financial projects for the client community. Requires expertise in CICS, MVS, COBOL, IDMS, TSO/ISPF, and PANVALET. ADS/O, CULPRIT, MFG/FIN/BOM preferred.

SR. SYSTEMS ANALYST Data Base/Data Administration/1

Position requires 5 or more years experience in data processing with 3 or more solid years experience in the implementation and administration of Cullinet IDMS data base and related supporting products. Candidate must have good communication skills and will work closely with the client community

in establishing procedures and standards for the use of data dictionaries, end-user computing tools and in data base design. Experience with ADS/O, ASF, OLQ, IDB will be considered a definite benefit.

SR. SYSTEMS ANALYST CAPACITY PLANNER/4

Candidate should have 2 or more years experience in capacity planning/analysis, performance measurement/evaluation, and modeling; will participate in the development of long-range hardware planning forecasts; will provide management with resource usage reporting. Requires expertise in MVS, TSO, ISPF, RMF/SMF, MICS, SAS, BEST/1, and CMF.

PROGRAMMER ANALYST/6

Requires 3 or more years experience in a financial/data processing environment. Involves systems design and programming computer spreadsheet applications, and data base applications using TIF under VM/CMS, utilizing an IBM 4361. Heavy user interface and training with 20/20, TIF and GDDM.

FINANCIAL SYSTEMS ANALYST/7

Requires 3-7 years experience in developing, designing and installing custom or purchased financial applications systems. Accounting or finance degree preferred. Background in COBOL, IDMS, CICS, SDLC would be an extra benefit. Requires heavy user contact and adaptability to a constantly changing environment.

Northrop offers a highly competitive starting salary, commensurate with experience level, plus a comprehensive benefits portfolio including complete medical/dental/life insurance, 401(k) plan, tuition reimbursement and retirement program. For consideration, forward resume with salary requirements to: **Employment Representative M.S.M., NORTHROP CORPORATION, Defense Systems Division, 600 Hicks Road, Rolling Meadows, IL 60008.** We are an equal opportunity employer M/F/V/H. U.S. Citizenship Required.

NORTHROP

Defense Systems Division
Electronics Systems Group

System Developers 800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Redwine and ask for our free resume workbook & career planner.



Scientific Placement, Inc.
P.O. Box 19949 CW Houston, TX 77224 713/496-6100
UNIX is a trademark of Bell Labs

HP 3000

Technalysis is a nationwide consulting services firm. We are currently building teams of competent, experienced system design, analysis and programming personnel to work on a large HP3000 development project in TRANSACT/3000. Our current positions require excellent communication skills and relocation to Michigan.

Send Resume Immediately to:



20100 West Civic Center Dr.
Southfield, MI 48076
(313) 352-2440
Equal Opportunity Employer

ACHIEVERS ONLY

- | | |
|-----------------------------|---------------------------|
| • ADA • BASIC • COBOL | • PL/1 • FORTH • IMAGE |
| • REAL TIME • FORTRAN 77 | • CAD/CAM • AI • GRAPHICS |
| • COMPILERS • ROBOTICS | • APL • ASSEMBLER • SNA |
| • MVS/XA • DOS/VSE | • UNIX • C • LANS |
| • CICS • IMS • IDMS | • IBM 303X • 308X • 43XX |
| • TELECOMMUNICATIONS | • MICRO SOFTWARE |
| • SYSTEM/38 • RPG III | • VAX • UNIVAC |
| • DPS 8 • GCOS • DM IV | • EDP AUDIT/SECURITY |
| • SOFTWARE RESEARCH | • DATA BASE MANAGEMENT |
| • MOD 204 • ADABAS • ORACLE | • X.25 NETWORKING |

BRUCE A. MONTVILLE
Managing Partner

TOLL FREE
(800) 258-7328

EXETER 2100™
NATIONAL RECRUITING CONSULTANTS

Computer Park, Box 2120, Hampton, NH 03842/(603) 926-6712

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

DATA PROCESSING PROFESSIONALS

DATA PROCESSING SOFTWARE AND SERVICES FOR THE FINANCIAL WORLD

SYSTEMATICS, INC. is a unique part of the data processing industry. We specialize in providing a full range of data processing services to the financial community. As one of the largest and most rapidly expanding data processing firms in the nation, SYSTEMATICS, INC. serves over 700 banks across the country with facilities management, banking application software, and remote processing services.

Due to our continued growth, we are currently recruiting for qualified professionals in many of our data centers as well as at our corporate headquarters. Our needs include programmer/analysts, systems analysts, programming managers, data center managers, technical liaisons, and corporate data processing personnel. Experience in banking and/or financial applications, IBM, Cobol, and CICS could qualify you for these career opportunities.

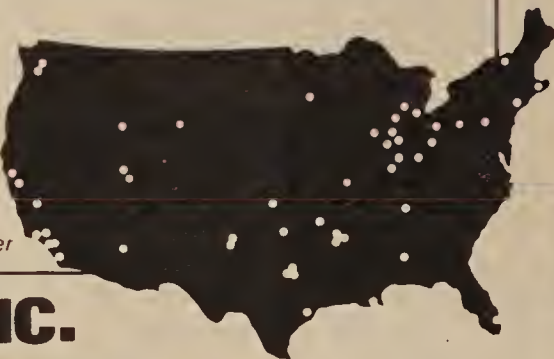
SYSTEMATICS, INC. offers competitive salaries, comprehensive benefit packages, in-house education, paid relocation, and semi-annual salary and performance reviews.

If you would like to be part of our exciting, growing environment, please submit your resume in confidence to:



Recruiting Department
SYSTEMATICS, INC.
4001 Rodney Parham Rd.
Little Rock, AR 72212

No agencies, please
An Equal Opportunity Employer



SYSTEMATICS, INC.

NEW ENGLAND

BOSTON PRODUCT SUPPORT - SR. P/A

Leading s/w devel. firm seeks seasoned pro for pre & post sales support. Must have BAL prog. skills in either IBM OS or DOS environs. Excellent mix of tech. & comm. skills req. Salary to \$40,000.

BOSTON SYSTEMS ANALYST

Expanding savings bank seeks well-grounded tech analyst w/ strong banking sys. exp. NCR mainframe NEAT/3, CIF, CLASS environ. w/loan, savings, DDA sys. Strong leadership, analysis & design skills a must. Mid \$30's.

BOSTON SR. PROG./ANALYST - HP3000

RTE. 128 area mfg./dist. firm seeks upwardly mobile P/A for add. to staff. Environ. is multiple HP3000's IMAGE COBOL RPG COGNOS. Oppty. to join ind. leader as it expands apps. staff to support growing bus. \$33,000.

HARTFORD DIRECTOR PLANNING

Manage the devel. of a long range strategic plan for future application devel. bkgrd. in corp. finance and investment + a strong bkgrd. in sys. devel. Will work at a sr. level & manage a staff of sr. designers/planners. Excellent growth potential. To \$60K+.

HARTFORD D/BASE (IMS)

Do you want to pursue a tech career in data base, data modeling or performance? If you have min. 2 yrs. of DP exp. w/strong tech. skills, you may be qualified. State-of-the-art IMS shop will provide IMS DB/DC training. \$30-\$45K.

PROVIDENCE PROG./ANALYSTS

Sun, surf & software! Leading R.I. fin'l. institution seeks solid COBOL P/A's for online devel. Min. 2 yrs. IBM exp. \$29,000.

UNIVERSITY OF OKLAHOMA HEALTH SCIENCES CENTER OKLAHOMA CITY CAMPUS

Director For Computing Services

Administrative Officer position available. Incumbent will report directly to Vice Provost for Administration and Finance, University of Oklahoma Health Sciences Center. Responsible for overall direction and management of computing services supporting the administrative and the research and education functions. Graduate degree in information science, computer science, information technology or a related field. Incumbent must have demonstrated successful experience in organizing and directing the activities of computer specialists and professionals, evaluating major computing systems and meeting the varied needs of both scientific/research oriented users and administrators. Advantageous to have had successful experience in computer operations in an academic setting; in distributive processing which includes micro computer network interfacing large Burroughs mainframe; and in telecommunications planning. Salary negotiable and commensurate with qualifications. Send resume and names of 3 references to: Director of Personnel, University of Oklahoma Health Sciences Center, P.O. Box 26901, Oklahoma City, OK 73190 not later than June 30, 1986.

The University of Oklahoma Health Sciences Center is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF IOWA

System Programmer: Local Area Networks (LANs)

The Weeg Computing Center provides primary support to faculty, staff, and students for instructional and research computing. There is an immediate opening for a System Programmer II in the Personal Computing Services group to provide support for users of personal computer based local area networks (LANs) on campus.

Primary responsibilities include assisting users in the selection of hardware and software for LANs, assisting with hardware and software installation, network operation and trouble shooting, user training, and planning for network growth.

A Master's degree or equivalent combination of education and experience is required. Considerable knowledge and experience in programming is required including experience in an assembly language. Knowledge of operating system software is required. Experience with IBM personal computers and personal computer based local area networks is required. Experience with Ethernet, Nestar, IBM NETBIOS, and AppleTalk is desirable.

Mike Noth
Assistant Director
Weeg Computing Center
University of Iowa
Iowa City, Iowa 52242

The University of Iowa is an Equal Opportunity/Affirmative Action Employer.

Maximize Your Opportunities

Consulting may be the right move for you.

Your next career move can give you more technical diversification, a better grip on continuing career progress, more responsibility and much better compensation.

We're Global Computer Corporation, a rapidly growing data processing consulting firm now with offices in four markets. We're recruiting data processing pros who are interested in consulting and who have solid capabilities in one of the following areas:

- IBM DOS to MVS Conversion Specialist
- IBM-MVS/DOS Systems Programmers/Programmer Analyst
- DEC/VAX Programmer Analyst/Systems Programmer
- DEC/VAX Training Coordinator
- DEC/VAX Manufacturing Analyst/Systems Manager
- Subcontractors Welcome

If you're considering a change, let's sit down and discuss the career and financial advantages of joining the Global Computer team as a full-time consultant. To pursue these opportunities in utmost confidence call collect or write Bob Parsons, Global Computer Corporation, Technical Support Services, 6500 Busch Blvd., Suite 210, Columbus, OH 43229, (614) 846-0260. (No agencies please)



GLOBAL COMPUTER CORPORATION

An Equal Opportunity Employer

EDP PROFESSIONALS Live Work and Play in Florida

- IDMS, ADSO
- IMS
- DB 2
- COBOL, CICS
- UNIX C
- COBOL, MVS or DOS
- COBOL, PATHWAY (TANDEM)
- SAS
- BURROUGHS (GEMCOS, CANDE)
- MSA FINANCIAL SOFTWARE

IMI is Florida's fastest growing software services firm. We are on the move throughout Florida with positions open now in Miami, Tampa, Orlando and Jacksonville. Our rapidly expanding client list has created exciting opportunities for the truly growth minded EDP professional. If you would like to experience the Florida lifestyle and are a career-minded professional, contact Ms. Tracy Hartman to schedule your interview or send your resume to:



information management

8601 4th Street North-Suite 304
St. Petersburg, FL 33702

813-577-1738
800-282-8717 (Florida only)

An Equal Opportunity Employer M/F

☐ Full Service

☐ Data-Processing

☐ Placement

☐ Companies.

ALL FEES COMPANY PAID

Specializing in the Placement of:

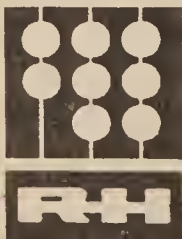
- Systems Programmers
- Managers
- Programmer/Analysts
- Systems Analysts
- Data Communications
- Operations
- Software Engineers
- Scientific Programmers

Target Search, Inc.
7658 Standish Place
Suite 105
Rockville, MD 20855
(301) 340-7009

Computer People, Inc.
Park National Bank Bldg
5353 Wayzata Blvd., Suite 604
Minneapolis, MN 55416
(612) 542-8520

EDP Professionals
305A Fairview Plaza One
Charlotte, NC 28210
(704) 554-1101
(704) 554-1102 (Modem)

ROBERT HALF



EDP PERSONNEL SPECIALISTS

Contact the Manager of any office listed below.

100 Summer St., Boston, MA 02110

(617) 423-1200

111 Pearl St., Hartford, CT 06103

(203) 278-7170

900 Turks Head Bldg., Providence, RI 02903

(401) 274-8700

Client Companies Assume All Fees.

SPERRY 1100

Permanent positions for Sperry programmers and analysts.

EXEC Internalists

TELCON Support

MAPPER Analysts

Call collect or send resume to:

COMPUTER STAFFING

10061 Talbert Avenue

Fountain Valley, Calif. 92708

(714) 964-2822

WASHINGTON, D.C.

DP MANAGER

Northeast manufacturer seeks skilled PDP-11 Programmer/Analyst to run shop. Operations experience is important. Must work with many people. Reports to Controller. Good benefits. \$34K.

ROBERT HALF

OF WASHINGTON, INC.

7316 Wisconsin Avenue Suite 401
Washington, D.C. 20814
(301) 652-1960

POSITION ANNOUNCEMENTS

SOFTWARE ENGINEERS

Advanced Programming Resolutions, Inc., a dynamic, growth-oriented, computer consulting company specializing in UNIX/C, operating systems, speech recognition, and graphics applications, has expanded its Columbus based-operation to include Chicago.

We offer:

- Challenging Software Development
- Career Path Opportunities
- Professionalism, Quality and Integrity
- Excellent Benefits and Compensation

Must have:

- Degree in Computer Science or Equivalent Work Experience; Master's Degree a plus.
- 1 Plus years minimum work experience in any of the following:
 - UNIX/C, Shell Programming
 - Real-time software development, design and debugging skills
 - Switching Systems requirements and architecture design
 - UNIX internals
 - MS-DOS internals and LAN of PC's
 - Call Processing
 - Digital Design Background and Analog Circuit Design

OUR SUCCESS IS OUR PEOPLE!

Please submit your resume to:

Robert D. Williams, Corporate Recruiter
Advanced Programming Resolutions, Inc.
2715 Tuller Parkway Drive
Dublin, Ohio 43017
(614) 766 6901

An Equal Opportunity Employer M/F/H/V

UNIX is a trademark of
AT&T Bell Laboratories

APR

Let Dunhill Put You In Your Place

We've been putting professionals in their places for more than 21 years—places of opportunities.

Trying to find your place in MVS, CICS, IMS and Communications Systems Programming? How about IMS, CICS, IDMS, and ADABAS Programming Analysis? We also have requirements for DEC, VAX specialists, and other DP opportunities. Your background in banking, financial, manufacturing experience preferred.

Let Dunhill of Charlotte, the Professional Placement Service, put you in your place...a place of opportunity! Please call or write **Keith Reichle, CPC, Data Processing Specialist, DUNHILL OF CHARLOTTE, INC.**, 6401 Carmel Road, Suite 107, Charlotte, NC 28226. (800) 438-2012 or (NC Call) (704) 542-0312.

Dunhill®

The International Personnel System

SYSTEMS ANALYST PERSONAL COMPUTER SPECIALIST

Applications are invited for the following positions for the nation's leading aviation University. Positions are located in Daytona Beach, FL. SYSTEMS ANALYST. Provide systems analysis and design for the automation of various University functions. A minimum of two-three years of Systems Analyst or Programmer Analyst experience and knowledge of COBOL required. A computer related degree, HP3000 experience and knowledge of QUICK/QUIV is preferred.

PERSONAL COMPUTER SPECIALIST. To establish and support IBM and IBM compatible personal computer program, survey and document user requirements and test and evaluate hardware and software. A minimum of one year of IBM and IBM compatible experience and well developed communication skills are required. A computer-related degree, knowledge of COBOL and two years experience with mainframe processing is preferred. Competitive salary and outstanding benefits package offered. Please send resume and salary requirements in confidence to:

Embry-Riddle Aeronautical University
UA Personnel Office
Star Route Box 540
Bunnell, FL 32010
904-673-3180 ext. 135
An Equal Opportunity Employer

MEMPHIS/MID-SOUTH

Welcomes you. We specialize in the placement of data processing and management consultant professionals and have done so for nearly 20 years. If you qualify for a position commanding a salary range over \$25,000, please contact us. Each inquiry receives the utmost confidentiality. Our clients pay our fees, provide you relocation assistance and offer great career opportunities.

ROMAC®

Brinkley Plaza
80 Monroe Avenue, Suite #420
Memphis, TN 38103
(901) 523-0500

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

E-SYSTEMS



We're launching one of the largest national recruitment efforts in our history.

It's coming to cities across the U.S.

Senior high-tech specialists:

E-Systems Garland Division is continuing to seek professionals with 7-plus years experience to work on important, long-range projects that challenge the very best of your high-tech expertise.

Dynamic and rewarding opportunities await those in technical and management-oriented capacities in the areas of electronic warfare, command, control and communications (C³), intelligence and reconnaissance, data handling, and guidance and navigation.

E-Systems will be visiting selected cities in the U.S. for interviews in the weeks ahead. Specific dates and times will be arranged on a personal and confidential basis.

The kind of opportunities available.

The positions available are for mid-

to high-level technical and management professionals. Salaries and benefits for these positions are competitive with the best. Other benefits include detailed relocation assistance to the Dallas area, advanced education programs, and a company-paid stock ownership program that lets you share in our solid Fortune 500 growth.

E-Systems and Dallas offer one of the largest and most stable high-tech environments in the country, with all the ingredients for a pleasant living/work environment and available continuing education. To get the full story — including our capabilities brochure — send your resume with a copy of this ad to: **Director of Staffing, E-Systems, Inc., Garland Division, Post Office Box 660023, Department 41TS, Dallas, Texas 75266-0023.**



E-SYSTEMS

The science of systems.

U.S. Citizenship Required. An Equal Opportunity Employer. M/F/H/V

DATA PROCESSING PROFESSIONALS

Are you ready for new challenges that will help move your career into the fast lane? Would you like to consider job opportunities that might increase your salary by 10%, 15%, 20%, or even more? Our client companies throughout New England urgently need Programmers, Analysts, Systems Programmers, Computer Operators, and Management personnel to fill currently open positions. If you are a relative newcomer with at least one year of experience or a seasoned professional seeking new challenges, please call or write:



**ART DIPRETE
MAXTECH AMERICA, INC.**

314 South Main Street, Concord, N.H. 03301
603-224-5121
No resume needed
All fees paid by client companies

DIRECTOR MIS Immediate Openings

HP 3000 Series 70 Shop using Powerhouse, COBOL IMAGE and QUERY is looking for someone to manage entire operation. This is an opportunity to get in on the ground floor of an expanding state of the art shop doing primarily new development work. There are both corporate and client applications in a service bureau atmosphere. Ability to lead and meet deadlines a must. This position reports to the president. Send resume and salary history to:

Box #CW-B4792
Computerworld
P.O. Box 9171
Framingham, MA 01701-9171



**Lachman
Associates, Inc.**

Committed to Software Excellence!

LAI is a systems software development and consulting firm that can use your talents in UNIX, MVS, C, Telephony, and Networking! We have over 100 full time salaried professionals, and have been leaders in UNIX related software development for the past 7 years. We promote the professional growth and fulfillment of our staff by providing a wide range of high quality services and products for our clients.

Opportunities in network communications, systems and telephony software, and systems admin/testing in Chicago, Columbus, Denver, Florida, and other locations. Geographical flexibility a real plus! For further information, please contact:

Lachman Associates, Inc.
Attn: Staffing-CW
645 Blackhawk Drive
Westmont, IL 60559

UNIX is a trademark of AT&T

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

ADR. CALL US BEFORE YOUR BRAIN GOES DEAD.



"Hello ADR, I've got a candidate for you."

There's nothing worse for a creative thinker than a job that offers you little or no chance to think. Without a challenge it's too easy to switch your brain into automatic. Which is not too far from switching it off altogether.

At ADR we pride ourselves on keeping our brains alive. With the challenge of developing new and better software systems. Everything from relational date base technology to PC products. That's how ADR has become one of the world's largest software companies. And why we're still growing.

A creative brain with a solid IBM mainframe and BAL background is what you need to get going again with ADR. That also gets you a good salary and benefits package—including relocation assistance—as well.

So if you feel like everything is going numb, call Mr. Gary Johnson at 1-800-ADR-WARE before it's too late. Or write to him c/o Applied Data Research, Orchard Road & Rt 206, CN-8, Princeton, NJ 08540.

ADR HELP US WRITE THE
HISTORY OF SOFTWARE

AN AMERITECH COMPANY

An Equal Opportunity Employer.

© 1986 ADR

Monarch Capital Corporation... OUR DIRECTION IS UP.

DP CONSULTANT, NON-TRADITIONAL PRODUCTS

MONARCH SYSTEMS GROUP is the data processing affiliate of the MONARCH CAPITAL CORPORATION, a progressive NYSE-listed family of financial services companies. Monarch Capital's high quality Disability and Variable Life Products have been trendsetters in the industry, and we choose to market these specialized products through multiple distribution channels.

We seek to hire a key DP Consultant to serve as a liaison between our Systems Group and our Variable Life Insurance Company. The ideal candidate will have a programming background with a solid understanding of Non-Traditional insurance and investment products. Variable Life experience a real plus. Well developed interpersonal skills, results-orientation, and a willingness to travel a must.

Don't miss this brand new opportunity to work with a winning team and a growing company. We offer an excellent compensation package and the opportunity for advancement. Send your resume immediately in confidence to Amy Hillsburg, Manager, Professional Staffing.



Monarch
Capital
Corporation

One Financial Plaza
Springfield, MA 01102-9002

An Equal Opportunity Employer M/F/H



SUCCESS STARTS HERE

Paid relocation, excellent benefits and salary commensurate with experience.

- EDL, AML, LANS (ROBOTICS)
- FORTRAN or COBOL, on HP-3000
- ADABAS/NATURAL (CICS A PLUS)
- PROGRAMMER on IBM-4700 or IBM-3600
- C, UNIX • COBOL, CICS • COBOL, DATACOM
- COBOL, PATHWAY, on TANDEM NON-STOP II
- MODEL-204 (HEAVY) • SAS, SAS/GRAPHICS
- TELEPHONY, P.B.X., SATELLITE COMMUNICATIONS
- ADA PROGRAMMERS (NEED SECRET CLEARANCE)
- COBOL, IMS DB/DC • TECH WRITERS • RPG II and RPG III

**SOFTWARE
SERVICES**

OF FLORIDA INC.

A subsidiary of ORBITAL INTERNATIONAL INC.

Call toll-free
National:

1-800-237-8181

Florida only:

1-800-282-4141

or send resume to:

Mr. Cy Dougherty, Personnel Director, Software Services of Florida, Inc.

PARAGON CROSSING, SUITE 124, 11300 4TH ST. N., ST. PETERSBURG, FL 33702

System (Software) Engineer - For central Ohio consulting firm to develop software components to be used in a computer communication subsystem for multi function operations system (MFOS) project where end results enables different computers to "talk" with each other, ie, exchange information, according to International Standards Organization (ISO) protocol, conform software's 2 high level communications network protocols (transport layer and session layer) to ISO, conduct research on computer interfaces needed for British telecom and other projects requiring the same ISO protocols implemented by MFOS; and conduct research on suitable operating systems and computer machines for use in MFOS. Requires MS Computer Science and 3 years experience as programmer, information systems. Academic program must have included at graduate level: 1 course each in computer networking, ISO protocol, data structures, computer architecture (hardware), basic statistical theory, and stochastic model theory; 1 research course in protocol specifications; 4 courses on computer operating systems (2 courses for UNIX and 2 courses for C); and 1 programming course using C and UNIX; graduate thesis research must have been on transport protocol and grammar for use in ISO computer protocol specifications. Exp. or academic research work must have included UNIX and C. 40 hrs/wk. \$30,000/yr. Qualified applicants only send resume with this ad to R. Lechler, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, OH 43216. Refer to JO #3023048.

DUNHILL OF ANDERSON YOUR EXTENSION TO DATA PROCESSING PROFESSIONALS

It only takes a call to Dunhill of Anderson to ascertain job opportunities available to Data Processing Professionals on a national basis.

Our office specializes in locating experienced Programmers, Programmer Analysts, Systems Analysts, and Systems Programmers for the most respected corporations in the nation.

We don't require an obligation and never charge a fee. All matters are held in strictest confidence.

Please call or mail resume to:

Ammie Thompson
Computer Specialist
Dunhill of Anderson, Inc.
P.O. Box 2585
Anderson, South Carolina 29622
1-803-224-7917 (Collect)

IN SAN FRANCISCO IT'S SPRING YEAR 'ROUND!

DATA PROCESSING PROFESSIONALS
skilled in Main Frames, Minis or Micros
- DATA-BASE or ON-LINE SYSTEMS -
Consider a move to the beautiful
SAN FRANCISCO BAY AREA.

Career opportunities offering
CHALLENGE, GROWTH and REWARDS.
LOGICAL OPTIONS

Incorporated Agency Est. 1975
One Market Plaza, Spear Tower, Suite #2014A
San Francisco, CA 94105 • (415) 777-3900

ILLINOIS-SR. PROG. ANALYST

Medium sized IBM DOS shop in Illinois has a fabulous opportunity for a strong COBOL Programmer Analyst to take on Senior responsibility in Mfg. Business, and Financial applications. Will act as Project Leader. Any exposure to IDMS database applications a plus. Salary to \$33,000.



ROBERT HALF
DATA PROCESSING
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

CSI FOCUSES THE BEST MINDS WHERE THEY MATTER!

We are CYBERNETICS AND SYSTEMS, INC., suppliers of data management systems for some of this nation's largest industries. Supported by our parent company CSX CORPORATION, America's leading transportation and natural resource company, CSI has both the strength and diversity required to provide our employees with an exciting and rewarding future.

CSI PROFESSIONAL SERVICES, our rapidly growing consulting service, addresses the data processing needs of major corporations throughout Florida and the U.S. Our expanding list of clients has created the need for additional Analysts, Project Leaders, and Programmers. We currently offer opportunities with the following skills:

- | | | | |
|----------------------------------|------------|--------|------------|
| *IBM | *BURROUGHS | *PRIME | *HONEYWELL |
| *IMS DB/DC | *CICS | *COBOL | |
| *UNIX | *ADR/IDEAL | *DNSII | |
| *STRUCTURED METHODOLOGY & DESIGN | | | |

CSI is committed to helping our people reach their long term career goals. We offer challenging assignments, attractive compensation and benefits, and technical training in our state of the art D.P. Center.

JOIN OUR TEAM TODAY!

Call (904) 359-7458 or send your resume to:



CSI PROFESSIONAL SERVICES
550 Water Street, Suite 500
Jacksonville, Florida 32202

*An Equal Opportunity Employer

Senior Programmer/Analyst

One of the nation's fastest growing publishers is looking for an experienced Senior Programmer/Analyst for its IBM System 38, Model 20. The successful candidate will have seven to ten years experience as a RPG or COBOL Programmer of an IBM shop, four year college degree, and a proven track record of success. If you have the above experience, along with good communication and interpersonal skills, this is an outstanding opportunity to advance your career in a rewarding and challenging position. Salary is commensurate with experience; excellent benefits provided, including a relocation package. Qualified candidates should forward their resumes to Steve Hicks, 505 Market Street, Knoxville, Tennessee 37902. An Equal Opportunity Employer.

PROGRAMMER/ANALYST

The Computer Services Department of the University of the Pacific is seeking individuals to work on a new IBM 4381-12, developing on-line administrative systems. Individuals will be using Cullinet's 4th GL and COBOL to work with an IDMS/R database. The operating system is native VM. Requirements: 3 years systems analysis and COBOL programming, plus an AA degree in Data Processing or a Bachelor's degree in Business or computer related field. Prefer experience in IDMS/R and ADS/O. Excellent benefits. Send resume and salary requirements to: Personnel Services, University of the Pacific, 3601 Pacific Ave., Stockton, CA 95211.

Equal Opportunity/
Affirmative Action Employer

Systems Engineer

Electronic Data Processing: analyze data processing requirements for installation and modification of existing systems; install and maintain computer and data communication equipment. Salary \$700 per week, paid holidays and sick leave. Five years experience. Bachelors degree required. Apply Job Service Of Florida, 1350 NW 12th Avenue, Room 280, Miami, Florida. Order # FL-4540253.

Analyst/Programmer - Analyze users requirements; design and develop software applications; write programs and databases; implement, test and debug programs. Use IBM 3081, COBOL, DEC 10 and DEC PC. Bachelor's degree in Computer Science. 9 months experience. 40 hour week, \$28K per year. Mail resume: Orlando Job Service, JO #5206453, 3421 Lawton Rd., Orlando, FL 32803.

Operations Research Analyst - Analyze assigned programs of industrial and business applications, reduce problems to computer-processed form. Using VAX 750 Hardware and COBOL language software implementation of the development plan including the writing of the necessary programs for business billing, invoicing, managerial accounting, quality control, and production control. Also using Fortran language and Digital Command language (DCL) to solve business and industrial problems. M.S. in Computer Science or B.S. in Computer Science with 1 yr. exp. reqd. Must have coursework in accounting & industrial Management. 40 hrs./\$435/wk. J.O. #NY8011030, D.O.T. Code: 020067018, mail resume to NYS Job Service JO#8011030, 175 Remsen St., 2nd Fl., Bklyn, NY 11201.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Programmers/Analysts/Consultants

4GL

Software Design Associates, a national leader in the development of applications and operating systems software, seeks professionals to join its advanced database technology groups. The skills we seek include:

- ADABAS/NATURAL
- DB2/QMF
- RAMIS

- PACBASE
- FOCUS
- NOMAD

- SQL
- IDEAL
- IDMS/ADSO

SDA offers a full benefits package including relocation assistance and visa sponsorship. Please respond to the branch office of your choice.



Corporate Office: Norman B. Merkin, Vice President
71 Fifth Ave., New York, NY 10003

Phoenix, AZ 85012
3300 N. Central Ave.
Attn: Don Wright
(602) 265-2077

Norwalk, CT 06854
50 Washington St.
Attn: Linda Shelinsky
(203) 852-1096

Ft. Lauderdale, FL 33309
1451 W. Cypress Creek Rd.
Attn: Mike Wheaton
(305) 771-3880

Chicago, IL 60602
20 No. Clark St.
Attn: Kim Kozimor
(312) 726-5406

Union, NJ 07083
1620 Route 22
Attn: Carol Moskow
(201) 687-5910

New York, NY 10003
71 Fifth Ave.
Attn: Anne Hutchison
(212) 741-5200

Melville, L.I., N.Y. 11747
275 Broadhollow Rd.
Attn: Peggy Yngstrom
(516) 752-0002

Cincinnati, OH 45246
155 Tri-County Parkway
Attn: Mike Clark
(513) 771-4554

Austin, TX 78751
1011 E. 53-1/2 St.
Attn: Cyndi Connolly
(512) 462-9564

An Equal Opportunity Employer M/F/H/V

Additional Offices In • California • Delaware • Georgia • Pennsylvania • London, UK

ARE YOU 4GT RIGHT STUFF?

If you are a superior performer looking for a creative working environment with more challenge and less bureaucracy, then 4GT wants to meet you!

Fourth Generation Technology, Inc. has a worldwide reputation for developing top quality, state-of-the-art large 4GL business systems. We are undergoing a rapid expansion and are looking for top performers to design and program in-house customer requirements. We can provide you a highly productive and stimulating working environment complete with dedicated production PCs and in-house mainframes.

WE NEED:

- Senior Systems Analysts (non-programming)
- Chief Programmer Analysts (lots of programming)

REQUIREMENTS:

- 5 years' experience developing business DP systems (4GL a plus).
- Verifiable record of sustained superior performance.
- Ability to work in a team environment.
- Able to handle 10% travel.

We offer excellent professional work conditions, salary and benefits. Send your resume, including salary requirements to: Ms. Susie Randle, Fourth Generation Technology, Inc., 10280 North Torrey Pines Road, Suite 350, La Jolla, CA 92037, Dept. 305.

Equal Opportunity Employer



System 38 Senior Programmer Analyst

A challenging position is available with Desert Hospital, a progressive 350-bed acute care hospital. The ideal candidate will have a minimum of three years experience in programming and system design, proficiency in RPG III and CL, and S/38 experience. Hospital experience is preferred.

We offer an excellent salary, ultra-modern work environment, and an outstanding flexible benefits package. For confidential consideration, please send resume with salary history to Personnel. PRINCIPALS ONLY, PLEASE.



1150 N. Indian Avenue
Palm Springs, CA 92262
Equal Opportunity Employer

PROGRAMMER/ ANALYSTS

METIER MANAGEMENT SYSTEMS, INC., a subsidiary of the Lockheed Corporation, is a rapidly expanding international company engaged in the development, marketing, and support of computer systems for project management applications. Our product, ARTEMIS, controls a 70% market share, and utilizes such features as a fourth generation language, a relational database, report generators, and extensive graphics capabilities. ARTEMIS is currently used by major companies in such industries as aerospace, public utilities, construction and government contracting.

We have multiple openings at present for individuals with programming skills and a familiarity with ARTEMIS. Locations include Washington, DC, Los Angeles, and Boston, with more needs projected across the country in the near future. Qualifications for these opportunities include a BS degree (or equivalent) in Computer Science, Math, or a comparable discipline and a knowledge of ARTEMIS, with exposure to project management desired. These positions require a blend of interpersonal, analytical and programming skills and offer experience in a variety of environments on highly visible projects in pre- and post-sales roles. Up to 50% travel may be required.

As an aggressive and growing organization, we offer a comprehensive benefits package which includes company-paid insurances with dependent coverage and a profit sharing plan, as well as a competitive salary commensurate with experience. Please send a resume with salary history to Mr. Bob Putney, Metier Management Systems, Inc., P.O. Box 770020, Houston, TX 77215. Metier is an equal opportunity employer m/f.

METIER

MANAGER, SOFTWARE DEVELOPMENT AND COMPUTER OPERATIONS

High tech firm specializing in nuclear power and chemical industries' risk, safety, and environmental analyses is seeking a leader of software design and hardware operations. Position will have responsibility for all phases of management of online operations, hardware procurement, and application software development. Successful candidate must demonstrate management and leadership qualities and have at least 10 years experience as a member of a data processing group interfacing with technical personnel. Candidate should possess an in-depth working knowledge of IBM personal and PRIME computer architectures, operating systems, and programming techniques. Experience with technical programming languages, including FORTRAN, C, BASIC, and ASSEMBLER is highly desirable.

Please send your resume and salary history to:

Wyatt L. Albertson
Pickard, Lowe and Garrick, Inc.
2260 University Drive
Newport Beach, CA 92660

THE ADVANTAGES OF CONSULTING

One data processing staff position may offer challenge. Another may offer prestige. Yet another may give you the latitude to grow in the direction of your choice. But a consulting position with Sycomm offers all three. Our incredible growth over the past five years has been the result of finding data processing consulting professionals, matching them with Fortune 500 clients, and giving them challenging assignments.

THE SYCOMM TEAM

At Sycomm, you enjoy advantages every DP career should offer...variety, challenge, and projects that make the most of your background. You'll also find something you may not have expected: the excitement of becoming involved in a company that is people-oriented, that gives you a chance to grow!

IMMEDIATE OPPORTUNITIES FOR PROGRAMMER/ANALYSTS

If you have at least two years' DP experience, excellent interpersonal skills and the desire to make the most of your expertise, we offer interesting applications for your knowledge in one or more of the following Sycomm regional offices:

MID-ATLANTIC REGION/headquartered in Central New Jersey and serving clients in New York, Philadelphia, New Jersey and Delaware.

Openings for Programmer/Analysts with any of the following skills:

FOCUS
VAX/VMS Internals
UNIX/C

IDMS/ADS/O
CICS/COBOL
PC Software Packages

SOUTHEAST REGION/Atlanta based and serving clients in North Carolina, Georgia, Alabama and Florida.

Openings for Programmer/Analysts with any of the following skills:

IDMS/ADSO
TANDEM
DB2/SQL

COBOL or PLI/IMS DB/DC
DATACOM/IDEAL
COBOL/CICS
BAL/CICS

MIDWEST REGION/headquartered in Chicago and serving clients in Wisconsin, Illinois and Indiana.

Openings for Programmer/Analysts with any of the following skills:

IDMS/ADS/O
FOCUS/RAMIS
COBOL/BAL/CICS
COBOL or PLI with
IMS DB/DC

TELON
HOGAN
DATACOM/IDEAL

**CALL HEATHER NORTH,
TECHNICAL RECRUITER
COLLECT AT (404) 951-1150
TO FIND OUT MORE...**

This telephone number can put you in touch with the advantages of consulting...with Sycomm. Our salary and benefits package is highly competitive; we offer bonuses and other incentives; we provide numerous opportunities for growth. Call us. It's really to your advantage.

If unable to call, for the Mid-Atlantic Region, send your resume to: Paul Rosenheim, Regional Technical Director, Dept. CW/0526, 235 Route 22 East, Green Brook, NJ 08812; for the Southeast Region, send your resume to: Chuck Danner, Regional Technical Director, Dept. CW/0526, 2100 RiverEdge Parkway, Suite 760, Atlanta, GA 30328; and for the Midwest Region, send your resume to: Cathy Ciarico, Regional Recruiter, Dept. CW/0526, 8420 W. Bryn Mawr, Suite 1055, Chicago, IL 60631.

An Equal Opportunity Employer
No Entry Level Positions Available

SYCOMM

**SYCOMM SYSTEMS
CORPORATION**

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

CANAAN

Marketing & Systems Professionals

Where talented professionals have a strategic edge.

Come to Canaan.

- Dallas
- Chicago
- Connecticut
- Los Angeles
- San Francisco
- Washington, DC

In the fast-paced world of computers, Canaan's one of the companies setting the pace. We got that way because we're a group of highly enterprising, progressive professionals. And we know how to treat our talent here with a substantial stock option program. If you're talented, share the same outlook, and are looking for a strategic career edge, come to Canaan.

We are a leader in the departmental computing industry. For example, we provide the only IBM VM/CMS compatible systems—an exclusive to the industry, and an excellent reason for you to join us.

Major Account Manager

This is an exceptional opportunity for high income, plus equity—combined with executive sales management responsibility. Your overall goal will be to increase Canaan's sales performance in the VAR and end-user markets, while strengthening your own success. Requires a proven track record of systems sales experience.

Systems Engineer

Acting as technical consultant, you will accompany salespeople to identify/meet customer needs and provide systems expertise. Position requires a college degree, or equivalent; significant systems experience that includes knowledge of IBM operating systems, especially VM/CMS; and excellent interpersonal/communications skills.

Expand your career with a more enterprising company. Canaan provides competitive salaries and extensive benefits, with an excellent opportunity for advancement. For immediate consideration, rush your resume and salary history to: Art Knapp, Technical Recruiter, Canaan Computer Corporation, 39 Lindeman Drive, Trumbull, CT 06611. An Equal Opportunity Employer.



CANAAN

THE HIGH-TECH ACHIEVERS

COMPUTER SYSTEMS ENGINEER OPENING

Sverdrup Technology, Inc., is an aggressive professional services company seeking a talented and experienced Computer Systems Engineer to support its high-technology contract with the U.S. Air Force's Arnold Engineering Development Center in beautiful southern middle Tennessee.

COMPUTER SYSTEMS ENGINEER

Incumbent will be responsible for advanced planning and preliminary design of integrated computer systems and digital communication networks supporting test data reduction/analysis and presentation functions associated with full-scale aeropropulsion system testing. Requires MSEE with 9 years experience in computer systems engineering. Experience must be in planning, conceptual development, design, procurement, and integration of real-time digital computational systems, including communication networks.

Our attractive compensation package features a competitive salary, excellent insurance coverage, qualified pension and savings plans, mortgage differential, and relocation assistance.

If your credentials match these requirements, please send your resume, detailing specific accomplishments and salary history, in confidence, to: John B. Cunningham, Jr., Employee Relations.

Sverdrup

SVERDRUP TECHNOLOGY, INC.
AEOC Group • Mail Stop 180
Arnold Air Force Station, TN 37389

An Equal Opportunity Employer M/F/H/V

U.S. CITIZENSHIP REQUIRED

No third parties

The Data Base Services Division of a major suburban Baltimore printer is looking for an individual to fill the position of Sr. Systems Analyst and supervise its Electronic Composition Department. The successful applicant should possess the following requirements:

- Bachelor's Degree in Communication Science, Information Science or related field. It is preferred that the candidate have a Master's Degree in Library or Information Science, Business Administration, or related field.
- Minimum of 3 years IBM assembler programming experience working with textual data bases.
- Minimum of 2 years experience in systems analysis and in designing applications for textual data bases, e.g., directives, indexes, abstracting publications, in an IBM mainframe environment.
- Demonstrated knowledge & competency in supervising programmers and production personnel.
- Excellent oral and written communication skills.
- Knowledge of composition systems would be a plus.

We offer a competitive salary and an excellent working environment. If you feel you qualify for this challenging position in a progressive department, please send your resume to:

CW-B4793, Computerworld,
Box 9171, Framingham, MA 01701-9171

- PROGRAMMERS • ANALYSTS
- TECH SPECIALISTS • IBM
- NCR • BURROUGHS • DEC
- MANUFACTURING
- BANKING
- SERVICE

SOUTHEAST



We provide a professional and confidential service. Absolutely no obligations. Please call or write

ADKINS AND ASSOCIATES, LIMITED
"Executive recruiters for data processing"
P.O. Box 16062 • Greensboro, N.C. 27406
919-378-1261

relocation and fees paid by client companies

When People Count Count On Us



Count on our In-house OP Consultants to secure the best position for you

- PROGRAMMERS •
- ANALYSTS •
- TECH SPECIALISTS •

Progressive companies with operations in the Carolinas, Virginia and Georgia. For additional information, contact

PEGGY ALLEN

(919) 288-9330

or write

Graham & Associates

2100-J West Cornwallis Drive
Greensboro, N.C. 27408

npa

FLORIDA

Dunhill

The National Personnel System

4140 NW 27th Lane, Gainesville, FL 32606
(800) 445-0618 - or - (904) 377-3022

Personalized confidential representation on a national basis for experienced...

SYSTEMS PROGRAMMERS - MVS VM, OOS, VTAM, NCP, SNA, CICS, IMS, IDMS, AOR, AOABAS UNIX OB2

DATA BASE SPEC - IMS IOMS ADR, AOABAS MODEL 204 OB2

PROGRAMMER ANALYST - IMS IOMS CICS, DL-1, COBOL, PL/I, FOCUS, AOS-O UNIX, C

Call collect or write today

Coordinator Of Academic Computing Services

Primary liaison between computing services and mainframe academic users. Bachelors degree required. Fortran essential; other languages desirable. Strong interpersonal skills necessary. Familiarity with statistical and graphics packages desirable; prior user services experience helpful. Salary competitive to \$31,000; excellent fringe benefits. Available August, 1986. Send letter of application, names of professional references and resume by June 30th, 1986 to Search Committee: User Services; Computing Services; State University Of New York College At Fredonia; Fredonia, New York 14063. SUNY College At Fredonia is An Equal Opportunity, Affirmative Action Employer. Minorities and women encouraged to apply.

PROGRAMMER
TECH SUPPORT ANALYST
WALL STREET
\$25-30,000 --

International brokerage house has unique opportunity for a night shift troubleshooter. Must be able to fix ABENDS, know IBM units, IBM UCL, 750 actual VSAM field expert. This environment is 308X, MVS/XA. Hours are 12-8am. All the benefits you could want! FEE PAID



ROBERT HALF
OF NEW YORK, Inc.
522 Fifth Avenue
New York, NY 10036
212-221-6500

** C ** UNIX ** LAN ** GRAPHICS **
** SQL DATABASE ** AI ** F77 **

If These Terms Define Your Areas Of Interest,
Our Interest Is You.

We are an international market investment firm based in Chicago with a mid-size and growing computer group committed to cutting edge hardware and software development. We are seeking talent on all experience levels and are particularly interested in your eagerness in accepting challenging development responsibilities.

Our computer design and development supports all aspects of our trading activity, from back office clearing and accounting to real-time market analysis. Our goal is to provide our traders with the most sophisticated tools possible, aiding them in reaching quick decisions in extremely competitive market trading.

We are currently implementing a large Ethernet LAN with diverse distributed servers and workstations from Data General, Sun, Britton-Lee and other vendors. Inherent in the design are graphical CRT displays, relational databases, and mathematical modeling in F77.

We need experienced people who are interested in this dynamic environment, and who can lend immediate highly-skilled support from systems to applications level in this continued development. If you enjoy individual responsibility and direct user contact, we have the right conditions for your professional growth. If our unfiled needs are your areas of specialization, please send a cover letter and resume of your particular skills to:

Box #CW-B4790
Computerworld
P.O. Box 9171
Framingham, MA 01701-9171

SENIOR DBMS
PROGRAMMER/ANALYSTS
(SAUDI ARABIA)

Our Riyadh data center needs experienced Senior Programmer/Analysts to join project teams with responsibilities for the development and support of highly complex applications in financial management, budgeting, payments, and engineering analyses. You will enjoy the personal recognition and variety of working in a small DP shop and at the same time become involved in the advanced systems environment of the National Computer Center.

Your 4 + years of experience includes design, analysis, and ADS/O programming skills in a IDMS/DC and OS/MVS environment. Comparable experience in other DBMS environments (e.g., DATACOMM/DB, ADABAS, DB2) will also be considered. In addition to your strong technical expertise, you are an independent problem solver with well developed communications skills. CICS, VSAM and PL/I applications experience would be a plus. Arabic fluency would be helpful.

We offer an excellent salary, relocation assistance, and allowances for housing, local transportation, and travel. Please send your resume to Mr. Ali Tuwaijri, Director of Data Processing, The Ministry of Communications, Riyadh 11178, Saudi Arabia.

THE SAUDI ARABIAN MINISTRY OF COMMUNICATIONS

PERMANENT AND CONTRACT POSITIONS
AVAILABLE IN CALIFORNIA

* PROGRAMMER/ANALYSTS *

- NEW DEVELOPMENT:
- SOFTWARE MFG & MAJOR CORPS.
- CICS/DL-1 • CICS • IMS • IDMS • DBA's
- IBM S/38, 36, 34 • WANG • VAX
- HP3000 • Project Leaders • S/38 Manager
- Mortgage Banking
- Financial • Mfg.

* SENIOR SOFTWARE ENGINEERS *

- VAX/VMS • Artificial Intell.
- ADA • Jovial • Pascal • C • PC's

* SYSTEMS PROGRAMMERS *

- NEW DATA CENTERS
- MVS-XA • MVS • CICS
- IMS • VM • DOS • XCS
- Telecom • Systems Mgr.

* MANAGEMENT *

- D.P. MGR. • HP3000
- Mortgage Loan Mgr • Proj. Mgr.

* SYSTEMS ANALYST *

- Sales & Distribution

ASAP, P.O. Box 3144,
Redondo Beach, CA 90277 213-318-1975

COMPUTER ANALYST

Computer Analyst for firm in Dayton, Ohio engaged in System design analysis and computer consulting. Receive description of problem in laymen's terms; write computer program, review work product; supervise 2-4 employees. Requires Bachelor's degree in Computer Science and experience with accounting, economics and unique computer courses concerning the most advanced analysis and design of software, meaning that the computer science experience in college must be from a very good computer science college as opposed to just any college; the performance in subjects as depicted by grades which demonstrates that the applicant can understand problems and create technical solutions; willing to start at the lower level for starting computer analyst with increases based upon actual performance on the job. No job experience required. Not less than 55 hours per week, 8:00 a.m. to 6:00 p.m., \$1,750 per full month. Send resume with this ad to L. Ellison, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216, Attn: JO #1048548.

Senior Researcher

Design & implementation of interfaces between ASCII based Computer Operating System and linearized Chinese Operation System. To participate in demo and liaison relation with prospective clients. Familiarity with DSS analysis and design, large scale software development & graphic programming. Knowledge of Chinese engineering style calligraphy and 8088 processor assembly language. Fluent in written and spoken Mandarin. Familiar with proposals for linearization of Chinese.

\$450/week

Job site/interviews: Santa Ana, CA

Send this ad and your resume to Job #CR 3284, P.O. Box 9560, Sacramento, CA 95823-0560 not later than June 9, 1986.

VM SYSTEMS
PROGRAMMER

The Computer Services Department of the University of the Pacific is seeking an individual with strong technical skills to be the Systems Programmer on a new administrative IBM 4381-12. The University is using Cullinet IDMS/R database operating in native VM. The individual will help maintain the VM and IDMS/R environments. Requirements: 3 years systems programming, plus an AA degree in data processing or a Bachelor's degree. Prefer experience in IDMS/R. Excellent benefits. Send resume and salary requirements to: Personnel Services, University of the Pacific, 3601 Pacific Ave., Stockton, CA 95211.

Equal Opportunity/
Affirmative Action Employer

Systems Analyst - Design custom tailored data processing systems for property managers. Obtain real estate facilities management data and convert it to programmable form for firm's clients. Maintain computerized inventory of space, personnel and equipment. Graphically monitored changes in inventories and assignments. Use computer systems to forecast available personnel and equipment. Conduct studies and investigation of available land and buildings. Demonstrate applications of software to potential users. Prepare reports, memos and manuals. \$2,548.85/mo. B.S. Computer Science or Architecture plus 4 yrs. exp. or 4 yrs. Systems Analyst (Field related to Architecture or Real Estate Development). Must have experience with computer aided design (CAD) systems. Job and interview in Corona del Mar, CA. Send ad and resume to Job #DB3171, P.O. Box 9560, Sac., CA 95823-0560 by June 4, 1986. If offered employment, must show right to work in U.S.

PROGRAMMER - Define data structures, detail system req. & system test plan. Use structured req. methodology, develop system back-up & recovery procedures as well as test data. Util. knowl. of COBOL, C, PASCAL, ASSEMBLER, DBASE II/III & WORDSTAR on IBM hardware. Req: Bach - Comp Sci or Elec Eng; 1 yr exp or 1 yr rel programming exp. Work 9-5PM; \$26,000/yr. Report to: Hamilton Job Service, 311 Whitehorse Ave., Trenton, NJ and/or contact nearest local Job Service Office. JO #0660532. NO FEE CHARGED.

NEW ORLEANS

Spicy! That's the flavor of New Orleans. New Orleans provides its residents an enviable lifestyle. Great restaurants, a warm climate, and world renowned celebrations, such as Mardi Gras and the New Orleans Jazz and Heritage Festival, have kept New Orleans the Queen city of the south.

But New Orleans is much more than a great place to live, it's a great place to further your Data Processing career. New Orleans is the home of MIDDLE SOUTH SERVICES, INC., the service arm of the MIDDLE SOUTH UTILITIES SYSTEM.

MIDDLE SOUTH SERVICES, INC. is currently involved in several projects including large scale IMS DB/DC systems development. The current hardware environment consists of (3) IBM 3090's, (1) 3084, MVS/XA, 438 VM/CMS and Tandem.

SR. ANALYST/PROGRAMMER - An experienced Analyst/Programmer is needed to assist our application development staff research and trouble shoot problems. The ideal candidate will possess extensive experience in the following: IMS DB/DC Control Block Gens, MVS utilities, ADF, COBOL, PL-1, TSO/ISPF, SAS, and RAMIS II. The candidate must also be familiar with the development and utilization of development work benches.

OPERATIONS ANALYST - Position involves 24 hour/day responsibility as the main link in resolving production problems. You will interface with users investigating production failures and assist in developing operation disaster recovery plans across all applications. The successful candidate will have extensive experience in a large scale computer environment as an Operations Analyst. The position requires a thorough understanding of OS/JCL, TSO, and knowledge of UCC/7/11. The ability to effectively communicate and cope with emergency situations is a must.

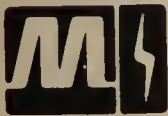
Middle South Services' relocation package includes: relocation allowance (one month's salary) ... paid moving expenses ... paid house hunting trip ... mortgage interest differential ... plus interim living.

We offer an excellent benefits program and compensation package. For more information contact Joe Hotard or Jennifer Gary.

1-800-231-4481
In Louisiana call collect
1-504-569-4965
or send resume to:

MIDDLE SOUTH SERVICES, INC.
P.O. Box 61000
New Orleans, LA 70161

An Equal Opportunity Employer M/F/H



MIDDLE SOUTH SERVICES INC.

SOFTWARE TECHNICAL SUPPORT

Cincom is a recognized, worldwide leader in Data Base Data Communication and Application Software Technology.

We are looking for high-motivated software professionals to join our growing customer support organization.

CUSTOMER ASSISTANCE SPECIALIST

This position involves providing an initial level of support to Cincom clients with the emphasis on product usage.

Qualifications include a minimum of 3 years experience in the following areas:

- Application level experience with Data Base, Data Communication or On-line Application Development Systems. Cincom product knowledge a plus.
- Application level experience with the IBM main-frame operating environment (OS, DOS, TSO/SPF, JCL and UTILITIES).

Chosen candidates must have excellent communication and problem-solving skills. An undergraduate degree in Data Processing preferred but not required.

Cincom will provide a challenging work environment with state-of-the-art tools (IBM 308X, ISO/SPF, MVS/XA, etc.), comprehensive benefits, and a highly-competitive salary.

Send your detailed resume in confidence to:

Mark A. Masson
7980 Clayton Road
St. Louis, MO 63117



An Equal Opportunity Employer

COBOL Programmer/Analysts

PONDER THE POSSIBILITIES.

Think about your future for a moment. Examine your strengths.

Where would you like to be?

At The Travelers, DP pro's think about their future every day. They're in a setting that fosters professional growth. Surrounded by people like themselves, committed to what they do.

And, encouraged by our commitment to an advanced environment. Like our \$300 million data processing budget. Our 19 IBM mainframes. The largest IMS shop in the industry. A 23,000 terminal SNA network, accessing over 2,500 on-line data bases. Plus, the 13,000 PCs we've purchased and installed to stay on the cutting edge.

If you've got enough experience to know what counts in a company and a career, maybe it's time to turn your possibilities into a promising position. Maybe it's time to consider The Travelers.

PROGRAMMER/ANALYSTS & PROGRAMMERS

Talk to us about a variety of opportunities currently available in our Hartford, CT home office.

Exciting projects for professionals interested in developing, designing and implementing systems for financial services, insurance and general business applications.

Positions due to expansion vary. Many offer a variety of data base (IMS, DB2)



applications in an on-line, realtime environment. All offer rotation of assignments, many pure development.

Experience levels also vary. However, all call for 1 1/2 to 3 years of solid COBOL applications design and programming, TSO/SPF and OS/JCL. IMS or CICS skills are an asset. Strong oral/written communication skills to work with users essential.

At The Travelers, you'll find challenge, exposure and high visibility. Over 50 in-house DP courses. A Flex-

time program and complete benefits. Plus our commitment to keep our technology — and your career — advancing.

So, if you're deliberating over your next step, join The Travelers. And turn the possible into the probable.

For immediate consideration, send your resume and salary requirements to: Dorothy Smith, 30-CR, Mailstop CW526, The Travelers Companies, One Tower Square, Hartford, CT 06183.

Data Processing
For Dedicated People.

TheTravelers

The Travelers Companies, Hartford, Connecticut 06183.

An Equal Opportunity Employer.

INDUSTRIAL ENGINEER INFORMATION SYSTEMS SPECIALIST

The Military Sealift Command, a worldwide transportation agency is embarking on the development of command-wide information systems utilizing IBM compatible micro/mainframe computers. IDMS/R is the database management system chosen to build a corporate database for the Command. Industrial Engineer positions are at the GS-896-7, (\$23,170), GS-896-9 (\$26,893), GS-896-11 (\$29,018 - \$36,668) and GS-896-12 (\$31,619 - \$48,876) levels. Assignments require a broad knowledge of industrial engineering theory, concepts and processes to assist users, technical staff and managers in identifying, planning, designing, and implementing information systems. To apply, send form SF-171 or resume with earnings history to:

Military Sealift Command
Command Information Systems
5611 Columbia Pike
Falls Church, VA 22041

Vacancy Announcement M0800014 (GS-896-12), or M0800015 (GS-896-7/9/11), must be written on the SF-171 or resume. For further information contact Chuck Mosier at 202-756-1855.

An Equal Opportunity Employer
U.S. Citizenship Required

San Francisco

You might be worth more than you think!

We'll tell you, if anybody can; we've been here longer (12 1/2 years), know everybody in EDP worth knowing, and the best companies rely on us for the best people. Call today or mail your resume to Computer Resources Group, Inc., 303 Sacramento St., San Francisco, CA 94111, (415) 398-3535, or 3080 Olcott St., Santa Clara CA 95051, (408) 727-1658.

The Computer Resources Group, Inc.
NATIONAL COMPUTER ASSOCIATES

Silicon Valley

PROGRAMMER/ANALYST SYCOR

Atlanta Location

Equifax, a national leader providing information based administrative services to business, industry and government, has an opening for a SYCOR Programmer Analyst in our Atlanta home office.

Position requires experience working on 340 1440 SYCOR with TAL and/or SYCOR assembler programming skills. Strong written and verbal communications skills necessary; college would be a plus.

We offer complete employee benefits package, salary commensurate with experience and background. For confidential consideration, send resume to:

AJW-SHR
EQUIFAX SERVICES, INC.
P.O. Box 4081
Atlanta, GA 30302

Equal Opportunity Employer

EQUIFAX
THE INFORMATION SOURCE

A BETTER WAY OF LIFE



JOIN THE LEADING EDGE

OUR CLIENTS, the leading national and international corporations offer outstanding career opportunities, latest state of the art technology, nationally competitive salaries and the finest fringe benefits available in highly attractive Southeastern locations. Salaries from \$22-44 K.

ANALYST • PROGRAMMERS

with a minimum of 2 years experience in:

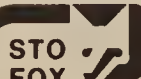
TECHNICAL SUPPORT
PROCESS CONTROL
SCIENTIFIC PROGRAMMING
COMMERCIAL APPLICATIONS

ON LARGE IBM MAINFRAME OR IBM 8100 DEC PDP OR VAX HARDWARE IN VM, MVS, IMS, IDMS, CICS, SNA/SLDC, DPPX, DPCX, RSX-11M+, DECNET

WE ARE PROFESSIONAL RECRUITERS

Our client companies pay our fees and your interview and relocation expenses. Your inquiries and our referrals are CONFIDENTIAL. You may call TOLL FREE 1-800-438-1056 (in N.C. 919-378-9894) or mail us a complete chronological resume or work history (handwritten updates are fine) — your current salary, career salary and geographic objectives

WE PRACTICE AFFIRMATIVE ACTION
personnel consultants P.O. BOX 29269 • GREENSBORO, N.C. 27429-9269



POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS



MANAGER- USER SERVICES SECTION SCIENTIFIC COMPUTING DIVISION

The National Center for Atmospheric Research (NCAR) has an immediate opening for the position of Manager of the User Services Section in our Scientific Computing Division (SCD). SCD provides computing support to 1400 researchers in theoretical and applied atmospheric and oceanographic science. Our computing facility comprises a complex environment ranging from personal computers to supercomputers. Local and remote users at 100 institutions access our machines via telephone dial-up, leased lines, private data networks, internetworks and satellite networks. Our User Services Section supports user needs in software libraries, user software, networking and telecommunications and information services.

The Manager develops short-range plans and budgets and aids in divisional long-range planning; develops requirement specifications for section projects; consults with staff and other section managers on internal needs; maintains communication regarding ongoing planning and goals, particularly in user and telecommunications support areas; plans user forums, including annual users conferences; represents NCAR and SCD at professional and public meetings; and participates as an active member or chair on technical committees for the preparation of RFPs for hardware and software.

REQUIRES: MA or MS in computer science, mathematics or engineering, OR an equivalent combination of education and experience; broad knowledge of, and skill in computer science and administration of technical programs; demonstrated high-level skills in some or all of the following: assessing user needs; providing user services for training, documentation, software development and maintenance, applications programming and systems software and hardware, and telecommunications network design; professional experience in a major scientific computing facility; and skill in managing a variety of computing support functions. **Salary Range:** \$3,494-\$5,242/month.

We offer an excellent fringe benefits package, including a tax-deferred retirement program and relocation assistance. Please submit letter of interest and resume to:

N. Lippincott, Personnel Administrator, NCAR,
P.O. Box 3000, Boulder, Colorado 80307.

An Equal Opportunity/Affirmative Action Employer

NCAR

National Center
for Atmospheric Research

Manager, Data Processing for major, national organization headquartered in Washington, DC.

Price Waterhouse has been retained to assist in a search for a manager of the in-house financial data processing department of one of our major clients in Washington.

The candidate chosen will be responsible for a staff of seven and a full range of data processing services, including systems development and operation of a Prime 9755. It is a highly visible position and calls for an aggressive, self-motivated individual with excellent communication skills. A B.S. degree is required, with experience implementing financial application systems. In-depth knowledge of the PICK operating system and BASIC is also required.

The Client offers a highly competitive salary and benefits package.

Please reply in confidence to: Price Waterhouse,
c/o P.O. Box 277, Annandale, VA 22003.

The Client is an Equal Opportunity Employer.

Price Waterhouse



NY METROPOLITAN AREA

Permanent Positions

Programmer Analysts
& Project Leaders
Design & Development

--BANKING--

CICS, any Database, ADABAS a plus.
MVS Systems Prog'r, 4-5 yrs exp.

ITEM PROCESSING MGR

IBM 3890-CPCS, min 5 yrs exp
DEC VAX VMS BASIC, 3 yrs exp

Call 212-398-9891

or submit resume to:

HANK WALSH ASSOC.,
16 W. 40 St., NY, NY 10018.

BROWARD COUNTY

CIVIL SERVICE OPPORTUNITY SYSTEMS PROGRAMMER II

(Large IBM) - \$30,111 - \$39,507 per year

Works on multiple IBM 308X systems. Responsible for software products, performance measurement and tuning, problem resolution, etc. Interact with others on project design and debugging hardware/software problems.

Requires graduation from an accredited four year college or university with major course work in computer science and four (4) years experience in technical systems analysis on IBM large systems equipment, utilizing IBM 308X system software, or any equivalent combination of training and experience. MVS experience is required. Software may include JES3, VTAM, NCP, CICS or RACF.

Official applications and additional information may be obtained from the **Broward County Personnel Division**, 115 S. Andrews Avenue, Ft. Lauderdale, Florida 33301. Phone (305) 357-6444.

EQUAL EMPLOYMENT OPPORTUNITY
M/F/H

ASSOCIATE DIRECTOR, DATA PROCESSING

Will be responsible for administering matters related to acquisition, development, implementation, and on-going enhancement of computerized systems for a 600 bed teaching hospital. Reporting to the Director of Information Services, the Associate Director will direct implementation of the Hospital's strategic information systems plan. Position requires knowledge of the health care industry and demonstrated success in a responsible position of a Data Processing department. Requires a baccalaureate degree and minimum 5 years experience. Graduate degree and university teaching hospital experience preferred. Salary open. Interested candidates should send a current resume to:

Richard L. TeBockhorst
Director, Information Services
North Carolina Memorial Hospital
Sixth Floor, Patient Support Tower
Chapel Hill, North Carolina 27514

An Equal Opportunity/
Affirmative Action Employer

Systems Analyst - Design, develop, test and implement computer systems software for IBM PC and cash management interface to company's integrated banking systems software packages using Fortran and C languages, DEC VAX 11/780 mini computers and VAX DBMS; maintain and enhance system software to upgrade operational efficiency. Bachelor's degree in Computer Science or Engineering plus 1 year experience in job offered or 1 year software design and analysis experience required. 40 hours per week, \$34,000 per annum salary. Mail resume to NYS Job Service, J.O. #8012024, 175 Remsen St.-2nd Floor, Brooklyn, NY 11201.

COMPUTER SYSTEMS ANALYST wanted to analyze complex business and financial application problems; design, develop and implement computer software using COBOL computer language and various software packages for Business/Financial applications including accounting and inventory control in commercial and manufacturing environments for use on Texas Instruments Minicomputers and a variety of mainframe computers; Requires M.B.A. in Business Computer Information Systems; \$27,000.00 per year; 40 hours per week. Send resumes to 7310 Woodward Ave., Room 413, Detroit, Michigan 48202. Ref. #32386.

PROGRAMMER-ANALYST for Data Processing Consulting firm in Dayton, Ohio area. Design, analyze, develop, debug, implement, and maintain software programs for VAX/VMS and VAX/UNIX computer systems. Programs will be written in Pascal, C and Fortran. Requires B.S. in Computer Science and one year in job described which must have included experience with Ingres DataBase and Graphics Package. 40 hr. wk. \$15.00 per hr. Send resume to L. Ellison, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216, ATTN: JO #1048334.

IBM 38

Programmers, Programmer Analysts with 1 year plus experience -- Let us update you on the rapidly changing IBM 38 market in the Western States and Sunbelt. To confidentially explore exciting new career opportunities rush a resume or call Deanna Gear.

DUNHILL OF

ALBUQUERQUE, INC.

1717 Louisiana NE, Suite 218, Dept. C
Albuquerque, NM 87110

(505) 282-1871

Exclusively Employer Retained

BANKING. SR. SYSTEM ANALYST. \$38K. Min. 3 yrs. exp. on MICR II UCCEL to supervise item processing. Call/send resume to Dept. C93, MSI, 400 Perimeter Ctr. Terr., #820, Atlanta, GA 30346. (404) 394-2494.

PROGRAMMER-Responsible for writing program specifications & testing of these programs for securities processing (mutual funds, corporate trust & stock transfers). 3 yrs exp or 3 yrs rel programming exp. HS Grad; knowl of COBOL, CICS, JCL, IMS/DB, DL/1, OS/VS & TSO/ISPF on IBM mainframe hardware. \$29,500/yr. 40 hrs/wk. Send resume to DD-30, ACSIS, Inc., 90 John St., New York, NY 10038.

VP-MIS

Well established \$1+ billion insurance company in the central mid-west seeks a DP professional to direct a staff of 40 in our IBM shop. Candidates must have 10+ years of experience and possess excellent leadership and communication skills. Excellent salary, bonus and benefits. Please send letter or resume to President at:

Box # CW-B4791
Computerworld
P.O. Box 9171
Framingham, MA 01701-9171

Programmer Analyst - Design, develop, implement and maintain application software for IBM Series 30XX mainframe computer hardware using COBOL, DL1, IDMS, JCL and OS/MVS; problem solving and system correction. Bachelor's degree in computer science or mathematics and 2 years in job offered or 2 years of programming design and analysis experience. 40 hours per week, \$35,000 per annum salary. Send resume to Job Service, 277 George Street, New Brunswick, NJ 08901 or nearest Job Service office. Refer to J.O. #0666876.

SYSTEMS ANALYST Financial TO High 30's

Ideal new opportunity to do external systems design on new financial systems at major new Twin Cities based MVS installation. Requires analyst/programming background in IBM environment. Data based systems modeling, software package experience a plus.

Call Mark David
at (612) 339-9001



**ROBERT
HALF**
DATA PROCESSING

3636 IDS Center
Minneapolis, MN 55402

SEMINARS

EDP SECURITY SEMINARS

Prevent costly addicents and security breaches in your Information Center. Attend this seminar and learn how to design and implement a successful EDP Security Plan.

Topics Include:

- Disaster Recovery
- Contingency Planning
- Time Theft
- Risk Analysis

Seminar Schedule

- June 2-6 Philadelphia
- June 9-13 Los Angeles
- June 23-27 San Francisco
- June 14-18 Miami
- August 18-22 Boston
- August 25-29 Las Vegas

TESTING METHODOLOGY SEMINARS

Increase data reliability by decreasing program errors. Learn testing techniques that will increase programmer efficiency and reduce the cost of your operation.

Topics Include:

- Important Testing Principles
- Development of Test Plans
- Defining Test Completion Criteria

Seminar Schedule

- June 3-4 Denver
- June 24-25 Miami
- July 15-16 Oahu
- August 13-14 San Francisco
- September 9-10 Boston
- September 15-16 New Orleans

J.P. WESTON TRAINING CORPORATION
714/592-2939

EDUCATION

EXPERIENCE COUNTS! NON-RESIDENTIAL DEGREE PROGRAMS

Professionals in any field may apply for at-a-distance Bachelor's, Master's or Doctoral degree programs in Management, documenting work experience instead of further classwork, and presenting a career accomplishment project instead of a standard thesis. The cost is moderate; the time for completion is shortened. Designed for working professionals. Program authorized by the California Department of Education. Students Worldwide.

CALIFORNIA UNIVERSITY for ADVANCED STUDIES

School of Professional Management
Office of the Dean, Room C-2
100 Galli Drive
Novato, CA 94947 (415) 382-1600

PUBLICATIONS

NEW BOOK!

"CICS Made Easy"

By Joseph J. LeBert

Learn CICS using this ideal reference/intro published by McGraw-Hill. How-to design systems and write complete structured Cobol programs. Menu Inq Chg Add Del debugging. Discover creative advanced browse techniques using TS. Numerous simple examples. Once you have mastered the material in this book you will be prepared to develop and maintain most CICS programs. 278 pp, 105 illustrations of must reading. Order today! Send \$29.95 plus \$3.00 S&H to:

On-Line Applications

P.O. Box 28, Dept. 21C
Ridgewood, New Jersey 07451-0026
(201) 444-7345

Computerworld Sales Offices

Publisher/Vice-President/Donald E. Fagan

VP/Sales/Edward P. Marecki
Manager/Marketing & Sales Operations/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
(617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
Northern Regional Manager/Ronald Mastro
District Managers/Jim McClure, Michael F. Kelleher
David Peterson, Bill Cadigan
Account Manager/Sherril Driscoll
Sales Assistant/Alice Longley
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

CHICAGO SALES OFFICE (312) 827-4433
Midwest Regional Manager/Russ Gerches
District Manager/Kevin McPherson
Sales Assistant/Jean F. Brodenck
COMPUTERWORLD, 2600 South River Road, Suite 304,
Des Plaines, IL 60018

NEW YORK SALES OFFICE (201) 967-1350
Eastern Regional Director/Michael J. Masters
Senior District Manager/Doug Cheney
District Managers/Joan Daly, Fred Lo Sapio, Frank Genovese
Account Manager/Gale M. Patemo
Sales Assistants/Mary Burke, Sue Larson
COMPUTERWORLD, Paramus Plaza I,
140 Route 17 North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 261-1230
District Managers/Bernie Hockswender, Carolyn Knox
Western Regional Director/William J. Healey
COMPUTERWORLD, 18004 Sky Park Circle, Suite 255,
Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
Western Regional Director/William J. Healey
Senior District Manager/Barry Milione
District Managers/Ernie Chamberlain, Mark V. Glasner,
Account Manager/Diane Fuller
Account Manager, Classified/Nicole Boothman
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
District Manager/Jeffrey Melnick
Eastern Regional Director/Michael J. Masters
Sales Assistant/Melissa Christie
COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330,
Atlanta, GA 30319

DALLAS SALES OFFICE (214) 991-8366
District Manager/Mark V. Glasner
Western Regional Director/William J. Healey
COMPUTERWORLD, 300 Broadway, Suite 20,
San Francisco, CA 94133

CLASSIFIED ADVERTISING (617) 879-0700
National Recruitment Sales Manager/Al DeMille
Recruitment Account Executives/Geoff Dodge,
Derek E. Hultzky
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
CW INTERNATIONAL MARKETING SERVICES
Managing Director/Frank Cuttita
COMPUTERWORLD, 375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171
(617) 879-0700

COMPUTERWORLD, 1060 Marsh Road
Menlo Park, CA 94025
(415) 328-8064

CW Communications/Inc.

Board Chairman Patnck J. McGovern	President W. Walter Boyd	Executive Vice-President Lee Vidmer
--------------------------------------	-----------------------------	--

Publisher/Vice-President, Donald E. Fagan. Senior VP-Communication Services, Jack Edmonston.
VP-Sales, Edward P. Marecki. Group VP-Circulation, Margaret Phelan. VP-Finance, William P. Murphy.
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700, Telex: 9S-11S3.

SALES Vice President, Edward P. Marecki, Manager/Marketing & Sales Operations, Kathy Doyle. National Recruitment Sales Manager, Al DeMille. Display Advertising Manager, Anne Hadley. Senior Coordinator, Carolyn Medeiros. Display Advertising, Maureen Carter, George W. Gniffin, Joy Forman. Classified Operations Manager, Cynthia Delany.

COMMUNICATION SERVICES Senior Vice-President, Jack Edmonston. Director Research, Kathryn Dinneen. Sales Promotion Director, Liz Johnson.

PRODUCTION Production Director, Peter Holm. Production Manager, Marlene Stibal. Paste-Up Manager, Patricia Gaudette. Typesetting Manager, Carol Polack. Art Director, Tom Monahan.

CIRCULATION Group Vice-President, Margaret Phelan. Circulation Director, Nancy L. Merritt. Corporate Fulfillment Director, Maureen Burke.

CONFERENCE MGT. GROUP President, William R. Leitch.
MIS Corporate Director MIS, Jeff Cordeiro.

Computerworld can be purchased on 3S mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106.
Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.

Foreign Editorial/ Sales Offices

Argentina: Ruben Argento, Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584. Telex: 22644.

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (05) 8L63238. Telex: 72827 (COMWR HX)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex: AA74752 COMWOR.

Austria: Dr. Manfred Weiss, CW Publikationen, Verlagsgesellschaft m.b.H., Josefstaedter Strasse 74, A-1080 Wein, Austria. Telex: 115 542 (sch/a).

Brazil: Eric Hippeau, Computerworld do Brazil, Rua Pedrosa de Morais 1553, 05419 Sao Paulo, SP Brazil. Phone: 814-9658-212-8750. Telex: 11 32017 (WORD).

Denmark: Preben Engell, Computerworld/Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (01) 955 695. Telex: 31566.

France: Axel LeBlois, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: 747 1272. Telex: 613234 F.

Hungary: Dezso Futasz, SZT Computerworld, P.O. Box 386, Budapest, 1536, Hungary.

Italy: Daniele Comboni, Computer Publishing Group S.R.L., Viale Restelli 5, 20124 Milano. Phone: (2) 688 9773. Telex: 333436 (GEJIT).

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (03) 551-3882, Telex: 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Bldg., 2-10 Kando Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: 230-4117, Telex: J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (05) 514-4218. Telex: 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (020) 64 6651. Telex: 18242 (CWCOM NL).

Norway: Mr. Morton Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (20) 64 77 25. Telex: 76476 9 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Gun Road, P.O. Box 750, Beijing 10039, People's Republic of China. Phone: (47) 814 6174. Telex: 222214 (CCW CN).

Spain: Neil Kelley, Computerworld/Espana, Barquillo 21-3 izda, Madrid-4, Spain. Phone: 231 23 85; 231 23 86; 231 23 88. Telex: 47894 (CW E).

Sweden: CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: 46 8 67 91 80. Telex: 14904 9 (NO-VACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonstrasse no. 15, CH - 8032 Zurich, Switzerland. Phone: (01) 55 10 77. Telex: 816710.

Taiwan: Grace Tang, ACE Media Agency Ltd., Room 503, 1, Fu Hsin S. Road, Sec. 1, Taipei, 10587, Taiwan, R.O.C. Phone: 751 3636. Telex: 14142 (ACE GROUP). (Representative for all CWCI publications).

United Kingdom: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WC1 8UT, United Kingdom. Phone: (01) 831-9252, Telex: 262346.

Euan Rose, Bill Dunlop, Barbara Levy, Christine Taylor, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1, United Kingdom. Phone: (01) 278 3415. Telex: 311951. (Representatives for CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: 72-76-30.

West Germany: Eckhard Utpadel, CW Publikationens GMBH, Friedrichstrasse 31, 8000 Munchen 40, West Germany. Phone: (089) 38172-0. Telex: 5215350.

Advertisers Index

ADR.....	3
Agile.....	63
Applied Software.....	23
AST Research.....	112-113
AT & T Information Systems.....	38-39,96-97
Austec.....	33
BBN Communications.....	90
Bytel.....	27
Cincom Systems.....	35
Codex Corp.....	65-68
Computer Associates.....	18,98
Computer Corporation of America.....	91
Cordata.....	115
Cullinet.....	76-77
CW/Circulation.....	100
CW/Classified Recruitment.....	124
CW/Executive Report.....	94
CW/Focus.....	86
CWIMS/Venezuela.....	80
CW/Micro Direct Shopper.....	13,15,24,114,116,118
Datacopy.....	15
Data Design Associates.....	71
Data General Corp.....	108
Digital Equipment Corp.....	41
E-Systems.....	8,10,12,14,23,99
Fischer Innis.....	19
Group Operations.....	109
Harris Corp.....	10,12,14
Help/38 Systems.....	107
Honeywell-Large Systems.....	88-89
IBM.....	57,82-83
Imrex.....	34
Information Center Conference.....	62
Infotron.....	36
Innovation Data Processing.....	7
Interface Group.....	123
IOMEGA.....	101,103
ITT Courier.....	54
Local Data.....	110
McCormack & Dodge.....	22
Mitrol Inc.....	63
MSA.....	23,147
N.B.I.....	56
NCR Corp.....	64
NMTC-Boston.....	116-117
Northern Telecom.....	28-29,120-121
Novell, Inc.....	51
Oracle Corp.....	11
Pactel Spectrum.....	104-105
Paradyne.....	44
Plus Development Corp.....	42-43
Quality Associates.....	99
Quality Micro Systems.....	59
Radio Shack.....	119
Realla Inc.....	58
Relational Database Systems.....	75
Relational Technology.....	26
Richard John & Co.....	70
SAS Institute.....	20-21,80
Softool Corp.....	62
Software AG.....	92-93
Software Engineering of America.....	9
Software International.....	87
Software Merchants Unlimited.....	31
SPSS Inc.....	122
StarTech Software Systems.....	84
Stern Consulting.....	47
Syllogists.....	99
Syncsort.....	5
Systems Solution.....	34
Sytek.....	60-61
Tandem.....	95
TASC.....	48
Televideo Systems.....	111
Tone Software.....	23,114
Topaz.....	30
Tower Systems International.....	45
Travelers.....	106-107
Triangle Software.....	102
Unilease Computer.....	81
United Software.....	40
Universal Data Systems.....	78
Unlimate Corp.....	46-47
Ven-Tel.....	148
Whitesmith Ltd.....	32
Wyse.....	52-53
XA Systems Corp.....	99
Xerox Corp.....	24-25,72-73
Zilog Inc.....	74

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

COMPUTER INDUSTRY

Honeywell names CEO

Honeywell, Inc. named Vice-Chairman **James J. Renier** to head its day-to-day operations as president and chief operating officer, positions that had been vacant for eight years. Renier, 56, was president of the information systems division from 1982 to 1985. Chairman and Chief Executive Officer Edson Spencer said Renier's appointment "will enable me to focus on Honeywell's long-range opportunities."

■
Tektronix, Inc. will reduce its work force by about 10%, cutting 2,000 jobs through "voluntary means" and layoffs if necessary. The Beaverton, Ore., electronic instruments firm will take a one-time charge associated with the cuts in the current quarter ending May 31 and will complete the reductions by Aug. 23. Corporate officers will take 10% salary cuts.

In the first deal of its kind with a foreign vendor, Japan's **Nippon Telegraph and Telephone Corp.** (NTT) signed a \$250 million, five-year contract last week to purchase digitized telephone exchanges from Nashville-based Northern Telecom, Inc., beginning in 1989. Northern Telecom won the procurement deal over AT&T in a bidding battle that dates back to the summer of 1985.

■
The former **Digital Equipment Corp.** employee who allegedly passed trade secrets to **Emulex Corp.** was banned by a federal judge in Colorado from using any of DEC's confidential information. Former DEC engineer **Charles Hess** worked as Emulex's director of engineering for only four days in 1985. DEC's suit against Emulex alleging trade secret misappropriation remains pending in New Hampshire.

Wang buys out Intecom

From page 146

Intecom, pummeled by a successful customer lawsuit and weakened by sagging sales, had looked to many observers as if it might not survive without being acquired by a major company. Intecom's high-end switches in its IBX product line compete with those of Northern Telecom, Inc. and AT&T, but Intecom, with sales of \$120 million last year, could not project the image of long-term market presence that many customers were looking for.

Before the merger, however, Intecom officials last week expressed optimism about the company's future, despite losses of \$7.9 million for the first quarter of 1986 and \$6.6 million for fiscal 1985. They said the company would return to profitability in the third quarter of 1986 through a strategy of selling to large companies that have sizable data transmission needs. But full-year losses are still projected.

The company acknowledged that it will pay \$12.4 million to American Network, Inc. (Amnet), a long-dis-

tance telecommunications firm in Vancouver, Wash., as settlement for the \$37.5 million Amnet recently won in a jury verdict against Intecom. The jury confirmed the plaintiff's claim alleging breach of contract, breach of warranty and fraud, all resulting from the sale of a TSX switch, a device that Intecom no longer offers.

Intecom officials said payment will likely come from Intecom's cash reserves of \$39 million.

In addition to legal difficulties, Intecom has been hurt by a slow market and by competitors that, according to Intecom President and CEO Erik T. Ringkjøb, have been trying to "buy the market" by underpricing their products. "AT&T is bleeding substantially in this segment of the business," Ringkjøb observed.

According to the merger agreement, each of the approximately 26.1 million shares of Intecom common stock not currently owned by Wang is to be converted into shares of Wang Class B common stock. Exxon Corp., which holds 30% of Intecom shares, has agreed to sell all its stock to Wang in exchange for Wang Class B shares.

The boards of directors of both Wang and Intecom have approved the merger.

downsizing as a result of this."

Analysts, citing ongoing contract negotiations with the Communication Workers of America union, say they believe Olson had no recourse but to discount the possibility of layoffs last week.

Olson becomes the 13th chief executive in AT&T's 101-year history. Brown, who has held the top post for seven years, will reach the mandatory retirement age of 65 in August.

In other management moves, AT&T elevated Executive Vice-Presidents Charles Marshall and Morris Tanenbaum to vice-chairmen of the board. Marshall will continue to direct external affairs and personnel organizations, while Tanenbaum retains authority over financial planning and strategic planning groups.

AT&T appoints Olson chairman

From page 146

turing of the corporate behemoth. "I suspect that under Tobias, Information Systems would be phased out as a separate unit. The writing is on the wall," noted Fritz Ringling of the Gartner Group, Inc.

The unified computer and telecommunications businesses could pave the way for a much-needed reduction of the AT&T work force. Such cutbacks could be accomplished either through attrition or layoffs, but Olson adamantly denied that any cuts are planned: "We don't see any major

Altos' 1985 performance brings strong predictions



ACTIVE ISSUES

Kathy Porteus

For a company that pioneered the market for low-end multiuser micros, Altos Computer Systems, Inc. (ALTO — 17½%) has relatively few arrows in its back.

One reason is that Altos dodged most of the bad news in 1985 when the market for multiuser systems grew only 3.5%, according to International Data Corp. "While everyone was bleeding horribly, Altos did relatively well," says George Elling, senior vice-president with Oppenheimer & Co. "Altos could really start gaining momentum as the business environment improves."

Analysts agree that the company's prospects look bright for fiscal 1987. And investors, noting Altos' ability to emerge from a difficult year with new product and distribution strategies in place, are currently supporting a \$17 to \$18 price level, up significantly from the \$9 to \$12 range where the stock languished for two years.

Earlier this month, the stock broke through \$19, but soon retreated on news that Phillip White, formerly vice-president of marketing, had left Altos to join Wyse Technology, Inc. as president. White's departure does not signal problems for the company, according to analysts.

Altos now emphasizes larger multiuser systems, such as its 32-bit 3068 and its products based on Intel Corp.'s 80286 chip. Such products have been well received, according to analysts. Don Sinsabaugh, managing director with Swergold, Chefitz & Sinsabaugh, Inc., says he expects Altos to announce during 1987 a product based on Intel's 80386 microprocessor.

Porteus is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

As a result of offering more powerful systems to its target customer base, Altos will eventually face more direct competition from mini-computer vendors such as Data General Corp. and Digital Equipment Corp.

But expanding the product line upwards, says Rich Edwards, analyst with Robertson, Colman & Stephens, "has very positive implications for gross margins and selling expense, because the average system prices are higher." Also, the company's recent technology transfer agreement with Tandem Computers, Inc. involving Altos' 3086 system provides Altos with extra credibility among OEMs and probable future business from Tandem.

Besides its transition to supplying larger multiuser systems, Altos is changing its distribution mix.

"What will propel the company's growth during 1987," Sinsabaugh says, "is the number of small OEM contracts Altos signed over the past six months with companies such as TWA and Jeumont-Schneider." According to Oppenheimer's Elling, more OEM deals are brewing.

Until shipments resulting from such OEM agreements begin, analysts expect Altos' quarterly sales to remain flat. Edwards of Robertson, Colman projects "two further quarters of shipments at roughly \$38 million, followed by a marked increase of about \$4 million each quarter, reflecting shipments to new OEM customers."

According to Edwards, Altos will earn 77 cents a share on \$143 million in sales for fiscal 1986, ending June 30th, and \$1 a share on \$174 million in fiscal 1987. Edwards admits his estimates are on the conservative side as a result of uncertainty about the U.S. economy and "how well international orders hold up." Foreign business accounted for 34.7% of company revenue during the third quarter.

More enthusiastic is Elling, who currently recommends purchase of Altos because the stock's "leverage is now on the up side." Elling estimates Altos will earn \$1.10 to \$1.20 a share in fiscal 1987. "If Altos gets OEM orders on-stream," Elling says, "these numbers could be better."

Intelligent Systems lays off 17, fires 3

By James A. Martin

NORCROSS, Ga. — Intelligent Systems Corp.'s Quadram and Intecolor divisions laid off 17 assembly workers and middle management employees because of an anticipated summer slowdown in sales and production.

The layoffs were attributed to continuing sluggishness in the personal computer plug-in accessory boards market. Other staff changes are a result of corporate restructuring under the helm of Robert Brown, who was named Quadram president three months ago. In addition, three product managers were fired for

"poor performance," while the Data-vue portable computer division increased its staff by six.

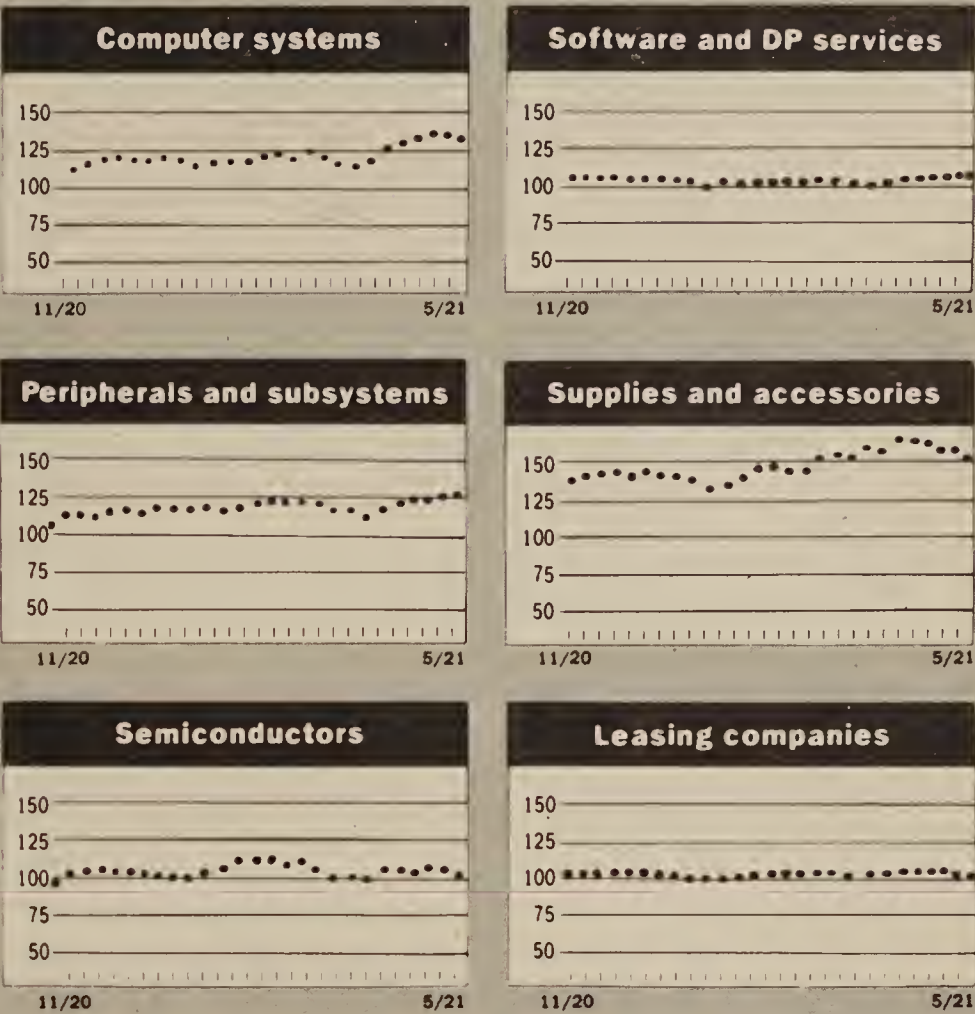
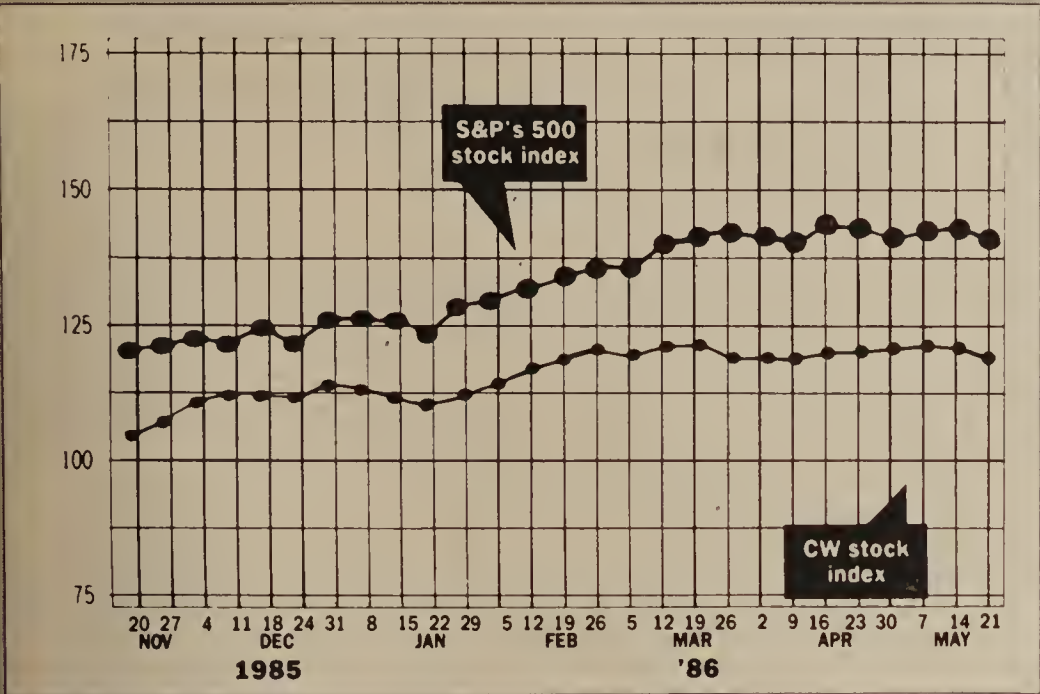
Separately, Intelligent Systems reported net earnings for the fourth quarter ended March 31 of \$1.2 million, or 10 cents a share, compared with a loss of \$7.2 million, or 64 cents a share, the previous year. Revenue for the quarter increased 9%, to \$35.1 million from \$32.2 million.

The firm had net income of \$33,000 for fiscal 1986, ended March 31, compared with \$1.8 million for 1985. Revenue was \$125.5 million for 1986, up from \$123.9 million.

COMPUTER INDUSTRY

MITCHELL J. HAYES

Computerworld stock trading index



	5/14/86	5/21/86
Computer systems	128.9	127.8
Software and DP services	106.4	106.1
Peripherals and subsystems	125.0	125.9
Supplies and accessories	154.6	150.8
Semiconductors	110.6	106.2
Leasing companies	104.6	104.2
CW stock index	121.5	120.0
Standard and Poor's 500 stock index	142.0	140.8

All indexes reflect a historical base of 100 on Dec. 31, 1984, and trace stock market performance in relation to that base. The CW stock index represents the unweighted average performance of the six categories of computer industry stocks.

Computerworld stock trading summary

CLOSING PRICES WEDNESDAY, MAY 21, 1986

X C H	PRICE					X C H	PRICE					X C H	PRICE				
	52-WEEK RANGE (1)	CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE	52-WEEK RANGE (1)		CLOSE MAY 21 1986	WEEK NET CHNGE	WEEK PCT CHNGE	52-WEEK RANGE (1)	CLOSE MAY 21 1986		WEEK NET CHNGE	WEEK PCT CHNGE			
COMPUTER SYSTEMS																	
O	ALPHA MICROSYSTEMS	5- 9	6 3/4	-1/2	-6.8	O	ADVANCED COMP TECH	2- 6	5 5/8	-1/8	-2.1	P	AM INTERNATIONAL	3- 8	8 1/8	-1/8	-1.5
O	ALTO COMPUTER SYST	9- 19	17 1/2	-5/8	-3.4	N	ADVANCED SYSTEMS INC	9- 20	17	-1/8	-0.7	A	ANDERSON JACOBSON	2- 5	2 1/4	+1/8	+5.8
A	AMOHL CORP	10- 18	14 5/8	-7/8	-5.6	N	AGS COMPUTERS INC	10- 25	20 3/4	-1/4	-1.1	O	AST RESEARCH INC	7- 33	17	-2 3/8	-12.2
O	APOLLO COMPUTER	9- 31	15 1/4	-1/4	-1.6	O	AMERICAN SOFTWARE	9- 15	12	+1/4	+2.1	O	AUTO-TROL TECHNOLOGY	3- 13	5	0	0.0
O	APPLE COMPUTER INC	14- 37	37	+1/8	+0.3	N	ANACOMP INC	2- 6	5 5/8	+1/8	+2.2	O	AVANT-GARDE COMPUTNG	3- 21	4	-3/8	-9.7
N	AT&T	19- 28	24 1/8	-1/4	-1.0	O	ANALYSTS INTL CORP	5- 11	7 1/4	-1/2	-6.4	O	BANCTEC INC	6- 12	11 1/2	+1/4	+2.2
N	BURROUGHS CORP	52- 71	58 3/4	-1 1/8	-1.8	O	ASHTON TATE	6- 30	28 1/2	-1 1/8	-3.7	O	BEEHIVE INT'L	1- 2	1 1/8	0	0.0
O	COMPAQ COMPUTER CP	5- 18	17 3/8	-1/2	-2.7	O	ASK COMPUTER SYSTEMS	7- 25	12 1/8	+5/8	+5.4	N	BOLT, BERANEK & NEW	20- 44	44 1/4	+1	+2.3
O	COMPUTER AUTOMATION	1- 9	2 1/8	-1/8	-5.5	8	ASTRAOYNE COMP INC	1- 3	1 5/8	-1/8	-6.8	O	CAMBEX CORP	1- 3	1 1/2	0	0.0
A	COMPUTER CONSOLES	5- 14	10 5/8	+1/2	+4.9	N	AUTOMATIC OATA PROC	35- 71	70	-1/4	-0.3	N	CENTRONICS OATA COMP	3- 11	6 1/4	0	0.0
A	CONTROL OATA CORP	15- 39	23 1/2	0	0.0	O	COMPUTER NETWORK	5- 9	7 7/8	-1/4	-3.0	A	CETEC CORP	6- 9	7 1/2	-3/8	-4.7
O	CONVERGENT TECHNOL	5- 13	9 7/8	+5/8	+6.7	O	COMPUTER ASSOC INT'L	9- 23	23	+1 1/4	+5.7	A	COGNITRONICS	4- 7	4 1/8	0	0.0
N	CPT CORP	4- 8	4 1/4	-3/8	-8.1	O	COMPUTER HORIZONS	5- 11	13 7/8	+1/2	+3.7	N	COMPUGRAPHIC CORP	23- 36	23	-5/8	-2.6
O	CRAY RESEARCH INC	25- 87	86 1/2	+4 3/4	+5.8	N	COMPUTER SCIENCES	13- 36	34 5/8	-1/2	-1.4	O	COMPUTER TRANSCIVER	0- 1	7/8	0	0.0
O	OAISS SYSTEMS CORP	11- 38	12 1/4	-1/4	-2.0	O	COMPUTER TASK GROUP	10- 28	24 1/4	-2 1/2	-9.3	N	COMPUTERVISION CORP	9- 44	16 5/8	-1/2	-2.9
N	OATA GENERAL CORP	31- 76	40 5/8	+7/8	+2.2	O	COMPUTER USAGE	1- 3	3	0	0.0	N	CONRAC CORP	12- 18	16 3/4	-1/4	-1.4
N	OATAPOINT CORP	5- 22	7 3/4	+1/2	+6.8	O	COMPUTONE SYSTEMS	3- 11	4 3/8	-1/2	-10.2	A	OATAPRODUCTS CORP	11- 20	17	+5/8	+3.8
N	ONIGAL EQUIPMENT	42- 91	87 1/8	-7/8	-0.9	O	COMSERV CORP	1- 6	3 1/4	0	0.0	A	OATARAM CORP	4- 17	16 1/2	-1/4	-1.4
A	EEOO INC	13- 17	17 3/8	+3/8	+2.2	O	COMSHARE	7- 13	13	+1/8	+0.9	O	OATA SWITCH CORP	4- 9	7 1/2	-3/4	-9.0
N	ELECTRONIC ASSOC.	3- 7	5 3/4	-1/8	-2.1	N	CULLINET SOFTWARE	12- 33	15 1/4	+1/8	+0.8	O	OATUM INC	5- 9	6 3/4	0	0.0
N	FLLOATING POINT SYST	18- 42	37 7/8	-2	-5.0	O	CYCARE SYSTEMS INC	13- 27	16 5/8	+2 3/8	+16.6	O	OECESSION OATA COMPUT	10- 20	12 1/2	+1/2	+4.1
N	FOXBORO	22- 31	29 1/4	-1/4	-0.8	O	HOGAN SYSTEM INC	4- 12	10 3/4	0	0.0	O	ENOATA, INC	2- 8	6 1/8	0	0.0
N	GOULO INC	20- 38	23 1/8	-3 5/8	-13.5	N	GENERAL ELECTRIC CO	56- 79	76 1/2	-1	-1.2	O	EVANS & SUTHERLAND	12- 27	26	-1	-3.7
N	HARRIS CORP	22- 35	31 3/8	-1 1/8	-3.4	N	GENL MOTORS E (EOS)	20- 49	48 1/4	-1 1/8	-2.2	O	GANOALF TECHNOLOGIES	5- 13	6 1/2	0	0.0
N	HEWLETT-PACKARD CO	29- 45	43 1/4	-1	-2.2	N	GTE CORP	38- 54	49 1/2	-1	-1.9	N	GEN'L OATA COMM IND	8- 21	12 7/8	-1/8	-0.9
N	HONEYWELL INC	54- 87	77	+3/8	+0.4	O	INFORMATION SCIENCE	1- 5	3 3/8	+1/8	+3.8	N	HAZELTINE CORP	17- 30	16 1/2	-1/2	-2.9
N	IBM	117- 158	144 1/2	-3 5/8	-2.4	O	INFOTRON SYSTEMS CP	13- 24	16	+1/4	+1.5	O	ICOT CORP	3- 12	12	+1/8	+1.0
O	IPL SYSTEMS INC	1- 4	3	+5/8	+26.3	O	KEANE ASSOCIATES	10- 20	14	0	0.0	O	INFORMATION INTL INC	10- 17	14 1/2	-1 1/4	-7.9
N	ITT CORP	28- 48	45 1/2	-1	-2.1	N	LOGICON	25- 43	36 3/8	+7/8	+2.4	O	INTECOM INC	3- 11	4 3/8	-1/8	-2.7
N	M/A-COM INC	13- 24	16 1/8	-1/2	-3.0	O	LOTUS DEVELOPMENT CP	15- 37	34 3/4	-1 3/4	-4.7	O	MEGADATA CORP	3- 8	3	-1/8	-4.0
N	MANAGEMENT ASSIST	2- 28	2 3/8	0	0.0	O	MCI COMMUNICATIONS	7- 13	10	0	0.0	A	MSI OATA CORP	7- 14	13 5/8	-3/8	-2.6
O	MATSUSHITA ELEC(AOR)	49- 98	87 1/2	-3 5/8	-3.9	O	MNGT SCI AMER INC	7- 16	14 3/8	+3/8	+2.6	N	NASHUA CORP	24- 52	49	+2 1/4	+4.8
O	MENTOR GRAPHICS	13- 30	16 3/4	-5/8	-3.5	O	MATHEMATICAL APP GRP	1- 8	1/2	0	0.0	O	NETWORK SYSTEMS CORP	11- 27	13 3/4	-3/4	-5.1
N	MOOLAR COMPUTER SYS	6- 9	8 7/8	-1/8	-1.3	O	MICOM SYSTEMS INC	12- 35	15	-1	-6.2	N	NO AMERICAN PHILIPS	32- 47	40 3/4	-5	-10.9
N	MOHAWK OATA SCI	1- 13	3 3/8	0	0.0	O	MICROPRO INT'L CP	2- 4	2 1/2	0	0.0	N	NORTHERN TELECOM LTD	26- 41	29 1/8	-7/8	-2.9
N	NBI INC	11- 20	11	-1	-8.3	O	NATIONAL OATA CORP	8- 25	22 3/8	-2 1/2	-10.0	O	OMEX	1- 3	1/4	0	0.0
N	NCR	25- 54	53 3/4	+7/8	+1.6	O	ON-LINE SOFTWARE INT	4- 16	13 1/2	-1 3/4	-11.4	N	PARAOYNE CORP	6- 18	10 3/4	+3/4	+7.5
N	PERKIN-ELMER	22- 36	29 5/8	-2 3/4	-8.4	N	PANSOPHIC SYSTEMS	14- 34	33 1/2	-7/8	-2.5	A	PENRIL CORP	7- 14	7 1/2	+1/8	+1.6
N	PRIME COMPUTER INC	15- 27	20 1/2	-3/4	-3.5	N	PLANNING RESEARCH	11- 23	22	-5/8	-2.7	N	PLESSEY CO (ADR)	19- 38	34 1/2	0	0.0
N	SPERRY CORP	39- 73	72 1/4	-5/8	-0.8	O	POLICY MGMT SYSTS CP	16- 35	19 3/4	-1 3/4	-8.1	O	PRINTRONIX INC	9- 18	13 1/2	+1/8	+0.9
O	STRATUS COMPUTER INC	9- 25	23 1/2	+1/2	+2.1	O	PROGRAMMING & SYS	4- 10	8 5/8	-5/8	-6.7	O	QMS INC	6- 16	13 3/4	+1/4	+1.8
O	TANOEM COMPUTERS INC	13- 33	32 1/2	+1 3/4	+5.6	O	REYNOLDS & REYNOLD	30- 65	31	+1/4	+0.8	O	RAMTEK CORP	2- 7	5 1/2	-3/8	-6.3
O	TANDY CORP	24- 44	39 3/4	-1 1/8	-2.7	O	SEI CORP	13- 27	24	-1/2	-2.0	N	RECOGNITION EQUIP	9- 17	16 3/8	+2 1/4	+15.9
O	TELEVIDEO SYSTEMS	2- 4	3 3/8	-1/8	-3.5	O	SHAREO MEDICAL SYST	26- 38	36 5/8	+1/4	+0.6	N	SANDERS ASSOCIATES	29- 44	29 3/8	-1	-3.2
N	TELEX CORP	6- 21	20 7/8	-7/8	-4.0	O	SCIENTIFIC COMPUTERS	4- 8	4 3/4	+1/8	+2.7	O	SCAN-TRON CORP	9- 22	19	+1/2	+2.7
N	TEXAS INSTRUMENTS	86- 141	136 5/8	+1/8	0.0	O	SOFTWARE AG	12- 22	20 1/4	-1 1/8	-5.2	N	SCIENTIFIC ATLANTA	10- 15	10 3/8	-5/8	-5.6
A	ULTIMATE CORP	8- 32	30 3/4	+1/4	+0.8	N	URS CORP	10- 18	15 7/8	+5/8	+4.0	O	SEAGATE TECHNOLOGY	5- 13	12 7/8	-3/8	-2.8
O	VECTOR GRAPHICS INC	1- 1	1/8	0	0.0	N	UCCEL	11- 21	20 1/4	-1	-4.7	N	STORAGE TECHNOLOGY	1- 5	4 1/4	0	0.0
A	WANG LABS "B"	15- 29	17 1/4	0	0.0	O	VM SOFTWARE	17- 29	27 3/4	-1	-3.4	O	SYKES OATATRONICS	0- 2	3/8	0	0.0
A	WANG LABS "C"	15- 29	17 1/4	+1/8	+0.7												
N	XEROX CORP	37- 72	57 3/4	-1 1/2	-2.5												
SUPPLIES & ACCESSORIES																	
N	AMERICAN BUS PROOS	21- 36	32 3/4	-1/2	-1.5	N	ADVANCED MICRO DEV	22- 36	25 3/8	-7/8	-3.3	A	T BAR INC	5- 9	5 3/4	-1/4	-4.1
N	BARRY WRIGHT	17- 29	23 1/8	-1/2	-2.1	O	ADV'O SEMICONDUCTOR	7- 23	11 1/4	-1	-8.1	A	TAB PRODUCTS CO	14- 23	21 1/4	+1/2	+2.4
A	OUPLUX PRODUCTS INC	13- 22	22 1/4	-1/8	-0.5	N	ANALOG DEVICES INC	14- 24	23	-3/4	-3.1	O	TANDON CORP	3- 9	7 1/2	+1/8	+1.6
N	ENNIS BUS, FORMS	14- 28	23 3/4	-3/8	-1.5	N	ANALOGIC CORP	11- 16	12 1/2	-1 3/8	-9.9	A	TEC INC	6- 13	5 1/2	0	0.0
N	3M COMPANY	74- 107	98 1/2	-3 3/4	-3.6	O	APPLIEO MAGNETICS CP	9- 19	18 1/2	-3/4	-3.8	N	TEKTRONIX INC	47- 68	59 3/4	-3/4	-1.2
N	MOORE CORP LTO	15- 27	23 7/8	-7/8	-3.5	O	AVANTEK	18- 26	18 1/4	-5/8	-3.3	N	TELEX	34- 68	63 1/8	-5/8	-0.9
O	STANOARO REGISTER	22- 45	38 3/4	-2 1/4	-5.4	O	HAOCO CORP	3- 7	5 3/4	-1/8	-2.1	O	TESOATA SYSTEMS CP	0- 3	5/8	0	0.0
N	WALLACE COMP SERVICE	30- 48	47 3/8	-3/8	-0.7	O	INTEL CORP	21- 33	26 1/2	-1 5/8	-5.7	N	TIMEPLEX INC	15- 23	18 1/4	+3/8	+2.0
						O	MICRO MASK INC	5- 12	5 1/2	-3/8	-6.3	N	TITAN CORP	4- 11	9 3/4	-1/8	-1.2
						N	MOTOROLA INC	29- 48	46 1/2	-1/4	-0.5	O	VISUAL TECHNOLOGY	1- 3	5/8	0	0.0
						N	NAT'L SEMICONDUCTOR	10- 15	13 7/8	0	0.0	LEASING COMPANIES					
						N	TERAYNE	17- 33	26	-1/2	-1.8	N	COMDISCO INC	7- 24	20 3/4	-3/4	-3.4
											N	CONTINENTAL INFO SYS	5- 21	19 3/8	0	0.0	
											O	FINALCO GROUP INC	3- 5	3 1/4	-5/8	-17.1	
											O	PHOENIX AMERICAN INC	2- 6	4 5/8	+1/4	+5.7	
											O	SELECTERM INC	6- 12	7 1/4	+1/4	+3.5	
											N	U.S. LEASING	32- 46	40	-3/4	-1.1	

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; 8=80STON;

COMPUTER INDUSTRY

INSIDE

Mohawk Data Sciences seeks re-birth in the hands of venture capitalists and a former courtroom nemesis/**114**

Some computer firms have scaled back European travel owing to the threat of terrorism/**116**

The U.S. semiconductor industry predicts 16% growth this year after its 17% sales drop in 1985/**118**

Honeywell names Vice-Chairman James J. Renier president/**144**

INSTANT ANALYSIS

"Authors of business plans are like would-be novelists. Almost no one will read their work, and the few who do will probably reject it."

— Richard A. Shaffer, editor and publisher, "Technologic Partners Computer Letter"

Wang buys out Intecom

Pays \$156 million for remaining 80% of switch maker

By Stanley Gibson

ALLEN, Texas — After two years of seeking an acquirer, Intecom, Inc. has found the large partner it desired. Last week, Intecom's 20% owner, Wang Laboratories, Inc., announced it will make the vendor of digital private branch exchange equipment a wholly owned subsidiary of Wang in a transaction valued at \$156 million.

In merging, Intecom gives up its independence in exchange for the credibility that comes from being a part of a major international company. Wang, in turn, gains a company with sophisticated switching products that it believes are strategically important. The pattern mirrors the relationship of Rolm Corp. and IBM, whose original 15% equity partnership led to Rolm's complete acquisition by IBM in

1984.

"The migration to twisted-pair wire in computing networks means that computer companies will have to get telecommunications capability. And all information will flow through a switch like ours," said C. Michael Bowen, chairman, chief executive officer and a founder of Intecom. Bowen said he had merger talks with nearly every major computer company as well as with such companies as General Motors Corp.

"Together with the smaller switch technology of Telenova, Inc., in which Wang has a 42% interest and the option to acquire control, Wang now possesses a very broad foundation for the integration of voice and data, which is essential to our industry," An Wang, chairman and CEO of Wang, said in a prepared statement.

See **WANG** page 144

Creditors dispute STC value

Poppa downplays import of \$300 million discrepancy

By Maura McEnaney

LOUISVILLE, Colo. — A \$300 million disagreement with creditors over the value of Storage Technology Corp. (STC) is standing in the way of an approved reorganization plan for the company to emerge from Chapter 11 of the U.S. Bankruptcy Code, STC's chairman said recently.

Chairman Ryal R. Poppa told analysts at a recent Hambrecht & Quist investment conference in San Francisco that the next few weeks should bring a consensus with the credit committee on how much STC will be worth as of Jan. 1, 1987, when it is expected to come out of bankruptcy.

"We believe the company is valued between \$500 and \$600 million, but the creditors are saying the company is only worth about \$250 million," he said.

Sources familiar with bankruptcy proceedings say valuation discrepancies like this one are the result of both sides attempting to get the most out of their dollar as well as a somewhat arbitrary means of determining a company's worth. When debt is being paid off in stock, creditors seeking the best deal want a company to be valued low in order to receive more shares.

Conversely, when a company is valued at a higher price, fewer shares need to be issued to meet the debt.

STC claims it owes creditors approximately \$700 million. The company's credit committee is now considering a plan that will give creditors \$100 million in cash, \$300 million in eight- to 12-year notes and the balance in equity.

STC recently asked the Federal Bankruptcy Court to invalidate some \$400 million of creditors' claims, including a claim from the European Computer Manufacturers Association. STC alleged that some claims were duplicates and others were

See **CREDITORS** page 118



STC's Poppa



INDUSTRY INSIGHT
Bob Djurdjevic

Amdahl, NAS at crossroads

At a time when industry headlines echo the woes of some vendors caught in an alleged slump, it is important not to generalize about the extent or the depth of the problem. IBM's single-digit growth may indeed qualify as a slump relative to the company's earlier optimistic forecasts. But Digital Equipment Corp.'s 86% earnings growth in the first quarter of 1986 and positive reports from other large vendors are reminders that the term "slump" may be an unjustified exaggeration of the industry's problems.

The business outlook for the two primary plug-compatible mainframe (PCM) vendors, for example, finds another market niche poised for rapid revenue growth. Both Amdahl Corp. and National Advanced Systems Corp. (NAS) have good reasons to be optimistic about their futures. Because of competitive pricing pressure, however, the two vendors' earnings will fall short of their revenue increases.

Amdahl, the original PCM vendor, has come a long way since June 1975, the date of the first customer shipment of the world's first IBM-compatible mainframe, the 470 V/6. As its 10th year ended Dec. 31, the company reported revenue of \$862 million. When the curtain drops at the end of this year, Amdahl may become only the second PCM vendor ever to reach the \$1 billion plateau.

Getting there, however, is only half

See **AMDAHL** page 117

Djurdjevic is a computer industry analyst and president of Annex Research, a Phoenix-based computer research and consulting firm.

HP announces flat earnings

RISC-based Spectrum could provide infusion

By Maura McEnaney

PALO ALTO, Calif. — Hewlett-Packard Co. produced further evidence of its need for the much-touted Spectrum program last week, announcing flat earnings and revenue for the quarter ended April 30.

Second-quarter revenue was \$1.78 billion, up only slightly from \$1.68 billion a year ago. Earnings declined 2% to \$127 million, or 49 cents per share, compared with \$129 million, or 51 cents per share, during the same period last year.

The revenue increase is due in part to a 12% increase in international or-

ders, the company said. Incoming orders climbed 6% to \$1.7 billion.

Year-to-date revenue at HP was \$3.4 billion, up 5% over 1985 figures.

Earnings, however, are down 4% to \$236 million, or 92 cents per share.

The financial figures come as no surprise to HP observers, who have been watching the company's order rate slip for about two years.

In a prepared statement, John A. Young, HP president and chief executive officer, said, "The fact is our U.S. business has been essentially flat for nearly two years. It continues to be a difficult business environment."

In February, HP unveiled its new product line based on reduced instruction set computing architecture.

See **HP** page 116

AT&T appoints Olson chairman, groups businesses under Tobias

By Alan Alper

NEW YORK — AT&T announced several major organizational changes last week, including the expected promotion of President and Chief Operating Officer James E. Olson to chairman and the grouping of its computer and long-distance businesses under the same executive.

Randall L. Tobias, chairman of AT&T Communications, will also become chairman of AT&T Information Systems effective Sept. 1. He replaces Robert E. Allen, who succeeds Olson as president and chief operating officer and joins the board of directors upon Chairman Charles L. Brown's retirement.

With Tobias presiding over Infor-

mation Systems and Communications, analysts said AT&T will be able to present a more coherent front to end users, many of whom have professed confusion over the firm's strategy.

Olson said AT&T would move to combine certain aspects of Information Systems and Communications so the firm could have one group representing its total array of products. He declined to say how the two groups would be combined, adding that "further steps will be announced as they unfold in the weeks and months ahead."

Some analysts believe Olson's statements presage a total restructuring.

See **AT&T** page 144



OUR MANUFACTURING SOFTWARE IS TAKING THEIR ECONOMIC SYSTEM OUT OF THE RED.

It's 1986. And some of the top people in the People's Republic have realized their backs are against the wall.

So who did they come to? Management Science America, Inc. After all, it takes more than inexpensive labor and material costs to

compete in the twentieth century.

It takes a complete mainframe manufacturing resource planning system. Like ours.

Which offers products that other software companies don't. And includes INFORMATION EXPERT.™ The fourth generation

technology that allows all your existing or new software systems to talk to one another.

For more information, you can talk to people in the People's Republic. Or talk to people at MSA. Namely Robert Carpenter at 404-239-2000.

MSA SOFTWARE
INTELLIGENCE OF A HIGHER ORDER.™

We invented the modem that makes fewer demands on your PC.

The Ven-Tel Half Card™ modem. All the power and speed of our regular modems, but with some major advantages for people who demand versatility from their PC.

Regular modems plug into one of your computer's full-size slots. Just like expansion boards—color boards, graphics cards and memory expanders.

The Ven-Tel Half Card modem is different. It plugs into a short slot, freeing up a long slot so your PC can handle an additional function. And while other modems have about 300 components, ours has 70.

So it not only demands less space from your computer—it also demands less power and generates less heat. Your PC

stays cool and stress-free.

Competitively priced, the Half Card modem is available in both 1200 baud and 2400 baud speeds. And it's backed by Ven-Tel's free *five-year* warranty. No other major manufacturer even comes close.

If you make a lot of demands on your PC... demand the less-demanding modem: The Ven-Tel PC Modem Half Card.

Ven-Tel Modems

Our free 24-page booklet, "How To Select The Correct Modem," contains specific information about our full line of modems. To request your copy, call 800-538-5121. In California, call 408-727-5721.